CALENDAR

OF THE

STATE AGRICULTURAL COLLEGE

OF COLORADO.

1881.

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Catalogue

OF THE

OFFICERS AND STUDENTS

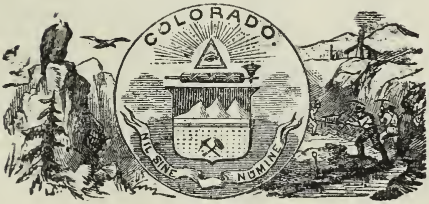
OF THE

State Agricultural College.

—OF—

COLORADO.

1881.



FORT COLLINS:
The Daily Express Book Print.

STATE BOARD OF AGRICULTURE.

Hon. B. S. LaGrange, Greeley,
President of the Board.

Hon. W. F. Watrous, Fort Collins.

Hon. John J. Ryan, Loveland.

Hon. David Boyd, Greeley.

Hon. R. A. Southworth, Denver.

Hon. Ozro Bracket, Frankstown.

Hon. Henry Foote, Del Norte.

Frederick W. Pitkin,
(Governor of the State.)
Dr. E. E. Edwards,
(President of the College.)
Ex-officio.

P. M. Hinman, Fort Collins,
Secretary of the Board.

30830

FACULTY.

E. E. EDWARDS, Ph. D., President and Professor of Moral and Mental Science.

A. E. BLOUNT, A. M., Professor of Experimental Agriculture and Mechanic Arts.

CHARLES F. DAVIS, B. S., Professor of Chemistry and Mathematics.

P. M. HINMAN, Secretary, Farm Manager, and Superintendent of Horticultural Department.

MRS. A. E. BLOUNT, Superintendent of Floral Department.

MRS. P. M. HINMAN, Matron of Dormitory.

STUDENTS.

Abbott, Albert,	Larimer County.
Abbott, Frank,	“
Akin, John,	“
Braley, John,	Missouri.
Campbell, William S.,	Larimer County.
Carpenter, George,	“
Carpenter, Henry,	“
Chaffee, Frank,	“
Cone, Ida,	Fort Collins.
Coy, Libbie,	Larimer County.
Coyte, Flora,	Fort Collins.
Coyte, Ralph,	“
Davis, Charles H.,	Boulder County.
Edwards, E. E.,	Lebanon, Illinois.
Edwards, Mary O.,	“
Emigh, Florence,	Fort Collins.
Edson, Phœbe,	“
Fertig, Maggie,	“
Fletcher, Violet,	“
Glover, George,	Boulder County.
Gilbert, Charles E.,	Deadwood, Wyo.
Hice, Edna,	Larimer County.
Hook, Nettie,	Cheyenne, Wyo.
Higby, Christopher B.,	Greeley,
Irwin, Nettie,	Fort Collins.
Knight, Josie,	Mississippi.

Loomis, Alonzo,	Fort Collins.
Loomis, Lelia,	“
Leach, May,	Virginia Dale.
Lyon, John,	Fort Collins.
Lyon, Mary,	“
Lyon, Hannah,	“
Markham, Jennie,	“
Marsh, Horace,	La Porte.
Marsh, Edith,	“
McClelland, Frank,	Loveland.
McClelland, Elmer,	“
Nicholas, A. M.,	Atchison, Kas.
Nixon, Samuel,	Fort Collins.
Patton, Knud,	“
Patton, Grace,	“
Post, Edward,	Pleasant Valley.
Plumley, Charles,	Fort Collins.
Plummer, Kitty,	Larimer County.
Rigdon, John,	Fort Collins.
Smith, Kate,	“
Smith, Larry,	“
Steele, A. W.	Denver.
Sullivan, Frona,	Loveland.
Thomas, Effie,	Fort Collins.
Thomas, Willie,	“
Thomas, Frank,	“
Trimble, Robert,	“
Vandewark, Fred,	“
Watrous, Frank,	“
Watrous, Anna,	“
Wilson, Lillie,	Cheyenne. Wyo.

COURSE OF STUDY.

PREPARATORY YEAR.

FIRST TERM.

Higher Arithmetic, Robinson.
Orthography and Elocution, Hamill.
Advanced Geography, Monteith.
English Analysis, Kellogg.

SECOND TERM.

Higher Arithmetic, completed.
English Analysis, completed.
U. S. History, Lossing.
Orthography and Elocution.

THIRD TERM.

Word Analysis, Levinton.
Elementary Algebra, Olney.
U. S. History.

FRESHMAN YEAR.

FIRST TERM.

University Algebra, Olney.
Elementary Rhetoric, Hill.
Natural Philosophy, Peck's Ganot.

SECOND TERM.

University Algebra, completed.
Advanced Rhetoric, Hill.
Drawing, Kensi; or, Lectures on Practical Agriculture.

THIRD TERM.

Geometry, Olney.
Structural Botany, Gray.
Outlines of History, Swinton.

SOPHOMORE YEAR.

FIRST TERM.

Geometry, completed.
Elementary Chemistry, Lecture.
Systematic Botany, six weeks.
English Literature, Shaw, six weeks.

SECOND TERM.

English Literature.
Trigonometry, Olney, six weeks.
Surveying, six weeks.
Organic Chemistry and Blow Pipe Analysis.

THIRD TERM.

Mechanics, Peck.
Analytical Chemistry.
Zoology, Orton.

JUNIOR YEAR.

FIRST TERM.

Mechanics, six weeks.
Anatomy, Lectures, six weeks.
Agricultural Chemistry, Lectures.
Geology, Dana.

SECOND TERM.

Chemical Physics, Atchison's Ganot.
Physiology, Flint.
U. S. Constitution, Townsend.

THIRD TERM.

Horticulture, Lectures.
Political Economy, Wayland.
Meteorology, Lectures.

SENIOR YEAR.

FIRST TERM.

Psychology, Lecture, Bascom.

Comparative Anatomy and Veterinary Science.
Mechanical Engineering.

SECOND TERM.

Logic, Jevon.
Food Stuffs, Lectures, six weeks.
Microscopy, six weeks.
Stock Breeding, Miles.

THIRD TERM.

Moral Science, Wayland, six weeks.
Household Economy, Lectures.
Philosophy of History, Lectures, six weeks.
Entomology, Packard.

The studies taught in the College are divided into five sections, viz:—Rhetoric and English Literature; Chemistry; Mathematics; Natural Science; Political, Moral and Intellectual Philosophy.

RHETORIC AND ENGLISH LITERATURE.

Exercises in Rhetoric, and Criticism and Lectures on the History and Analysis of the English Language and Literature. This department is temporarily under the charge of the President. In the absence of a classical course, it is the aim of the Faculty to make the English course as complete and thorough as possible, and to this end exercises in Composition will be required in all the classes during the entire College course.

In addition to the text books in this department, the following are recommended as books of reference:—Bain's Rhetoric; Marsh's Lectures on the English Language; Arnold's, Craik's, Taine's and Morley's works on English Literature; Mueller's Science of Language; Whitney's Study of Language.

CHEMISTRY.

ELEMENTARY CHEMISTRY.

A course of lectures, illustrated as fully as practicable by suitable experiments, is given in the first term of the Sophomore year. In this course are discussed the history of Chemistry; the laws of chemical affinity and combination; the chemical elements and their compounds; their geographical distribution, preparation, properties, chemical and other names; with the applications of Chemistry to the arts and manufactures.

Following the elementary lectures is a course of six week lectures on the chemistry of the carbon compounds, before the same class, who, at the same time—one hour daily during the first six weeks of the term, and two hours daily during the remainder of the term,—have practice in Blow Pipe Analysis, by which they learn to determine, in the dry way, the presence of the various bases and mineral acids.

QUALITATIVE ANALYSIS.

In the third term of this year, two hours daily are spent by the Sophomores in the use of reagents necessary for the detection of the properties and composition of bodies. As each student is supplied with a set of reagents, and is required to apply for himself the various tests and note carefully the results, a really practical knowledge of the most approved analytical methods is attained.

AGRICULTURAL CHEMISTRY.

How soils are composed; what their relation is to the growing crop; the relations of air and moisture to vegetable growth; how the natural forces may be made subservient to the needs of the agriculturist; the relation of Chemistry to the changes through which the plant passes in coming to maturity; the discussion of manures—their efficacy, etc. These are a few of the large number of similar topics which are discussed in the course of lectures before the class.

CHEMICAL PHYSICS

considers weights and measures; specific gravity; elasticity; cohesion; diffusion of liquids and gases; influence of light on chemical attraction; sources, nature and laws of light; spectrum analysis; heat; measurement of heat; thermometers and pyrometers; equilibrium of temperature; specific and latent heat; atomic relations of heat; electricity and magnetism; correlation and conservation of forces.

METEOROLOGY.

In a course of lectures is given the laws of storms, the constitution and weight of the atmosphere, and much attention is given to the various atmospheric phenomena with the different instruments used to observe and record their action and results.

COURSE IN MATHEMATICS.

In the Preparatory year the students are taken through Robinson's Higher Arithmetic, especial attention being given to the principles of decimal notation, proportion, business rules, evolution, involution and progression.

ALGEBRA.

In the last term of the Preparatory, the class study Olney's Complete Algebra. In the first and second terms of the Freshman year Olney's University Algebra is studied.

GEOMETRY.

Two complete terms are given to the study of Geometry, thus allowing the student to acquire a knowledge of this branch, as applied to plane and curved surfaces.

TRIGONOMETRY.

In the six weeks given to this study, the student is able to master the greater part of the principles given in Olney's work on the subject.

SURVEYING.

This subject is taught by actual practice, with appropriate instruments, in the field, where each of the class is required to run boundary lines, adjust the instrument for variation of needle, lay out ditches, and establish levels and grades.

MECHANICS.

Here is studied the laws of motion, falling bodies, composition and resolution of motion, centre of gravity, mechanical powers, the pendulum, central power, strength of materials, hydrostatics and hydraulics.

MECHANICAL ENGINEERING.

In this course is taught stresses on roofs and bridges; construction of farm buildings; roads; pure mechanism; work and strength of machines; farm implements and machinery.

NATURAL SCIENCE.

Recitations, Lectures, Experiments in Physics, Field Work in Botany and Geology, Dissections of Animals in Comparative Anatomy and Physiology, and study of Vegetable and Animal Tissues by means of the microscope.

ENTOMOLOGY.

This department of Science is studied with especial reference to the useful and injurious insects connected with agriculture and horticulture. A brief course of lectures will be given, in connection with a more extended study of the beneficial and injurious influences they have upon the cereals, trees, shrubs and flowers. Illustrations are given of the different species, and drawings accompany each lesson and lecture.

Books of reference:—Packard's Guide to the Study of Insects; Harris' Injurious Insects; U. S. Entomological Reports.

BOTANY.

During the Spring term of the Freshman year, Structural Botany will be taught by text book and lectures. Classification of the useful plants and noxious weeds is made, showing, by practical illustrations, the benefit of the one and the injurious effects of the other; the different modes of fertilization in all departments of vegetation.

Text books and books of reference consist of Gray's Structural; Manual; Field Book of Botany; Bessey's, Wood's and Yeoman's Botany; American Weeds and Useful Plants.

ANATOMY, PHYSIOLOGY AND HYGIENE.

The study of Physiology is preceded by a course of lectures on Anatomy, in which the student will be familiarized with the form, structure and location of the various organs of the human body. Attention will also be given to the anatomy of domestic animals.

In Physiology, the student will be made familiar with the functions of the various organs of the human body; and in Hygiene, with the conditions of these organs in health and disease, and the proper method of preserving health. Topics of discussion under the last head will be:—Foodstuffs; digestion; assimilation; circulation; secretion and excretion; respiration; the nervous system; the special senses; heredity; influence of climate; of stimulants, narcotics, etc.

Reference books:—Dalton's, Huxley's and Flint's Physiology; Gray's Anatomy.

ZOOLOGY.

Zoology includes the anatomy and physiology of animals, and the principles of classification, and will be illustrated by diagrams, by the use of the microscope, and by dissections, when practicable.

References:—Huxley's Comparative Anatomy of Vertebrates; Nicholson's Manual of Zoology; Orton's Comparative Zoology; Jones' Animal Kingdom; Coues' Birds of the Northwest.

GEOLOGY.

This study includes the history of the earth, as revealed by a study of its various formations and the dynamical agences—atmospheric, aqueous, glacial, igneous and organic—by which its geological changes have been affected. The study will be illustrated, the specimens and collections obtained, from American and Western rocks.

References:—Dana's Manual; Lyell's Principles; Lyell's Elements of Geology.

POLITICAL, MORAL AND INTELLECTUAL PHILOSOPHY.

Text Books and Lectures.

POLITICAL ECONOMY

includes the study of production, supply and demand, labor, capital, skill, exchange with money and credits, division of labor, premiums, bounties, monopolies, protection, laws, wages, profits, interest, taxes, rents, public debts, etc.

Books of reference:—Works of Adam Smith, Mill, Wayland, Bowen, Carey.

CONSTITUTION OF THE UNITED STATES.

In addition to a course of special and general history, the student is required to review portions of United States History, in connection with the study of the Constitution. The works of Townsend and Cooley are used for reference books.

LOGIC AND PHILOSOPHY.

Theoretical and practical ethics, and discussion of theories; lectures; the art of reasoning correctly by induction and deduction; a course in Psychology.

Books of reference:—Mills', Bain's and Fowler's Logic; Porter's Human Intellect; Wayland's Moral Science; Bascom's Psychology; Cousin's "The True, the Beautiful and the Good."

EXPERIMENTAL DEPARTMENT.

The advantages derived from successes achieved and failures made in the Experimental work on the College Grounds are of so great importance to the farming community that much time and labor are expended in this department.

The benefits received arise from saving and selecting seed; crossing and hybridizing the cereals and vegetables; grafting, budding and layering; adaptation of the different crops to different soils and the climate; subsoiling, drainage, ditching, trenching, irrigation and grading; modes of culture; rotation of crops; the best and most improved methods of seeding; manures, hot-beds and cold-frames, as well as transplanting, harvesting, storing fruits and roots.

THE AGRICULTURAL COLLEGE.

HISTORICAL.

THE State Agricultural College of Colorado was founded in accordance with the law of Congress passed July 2, 1862, authorizing a grant of ninety thousand acres of land as an endowment fund for an institution, the leading object of which shall be "to teach such branches of learning as are related to agriculture and the mechanic arts."

In accordance with the provisions of this act, the location of the College having been previously determined, the State Board of Agriculture, in a meeting held at Fort Collins, February 27th, 1878, ordered that a College building be erected on the College farm. The corner stone was laid July 29th, 1878, and in the same year the building was completed. Although some work had been done on the farm, the College was not formally opened until September 1st, 1879, when its first classes were organized, and a course of study, answering to the literary and scientific course of other schools, was outlined. This course has been since somewhat modified. The present Catalogue contains the names of the Faculty employed and the students enrolled since the organization, and the revised course of study. Since the opening of the College, a Boarding Hall has been erected, capable of accommodating from twenty to thirty students, and a Boarding Department established, at which students are furnished with board at cost prices.

ORGANIZATION.

The Faculty was organized, July 1st, 1879, by the election of the following members:—E. E. Edwards, Ph. D., President, and Professor Mental and Moral Science and English Literature; A. E. Blount, A. M., Professor of Agriculture and Farm Superintendent; F. J. Annis, M. S., Professor of Chemistry, Mathematics and Horticulture; Hon. H. Stratton, Secretary of Board and Faculty. At the close of the first year, Prof. Annis resigned, and Prof. Charles F. Davis was elected to succeed him. Secretary Stratton went out of office by limitation of term, and was succeeded by P. M. Hinman.

OBJECTS AND CHARACTER OF THE COLLEGE.

In accordance with the enactment of 1862, the leading object of this institution is to impart a thorough and practical knowledge of all those branches and sciences that pertain to agriculture and the mechanic arts. Its course of study differs from that of the University in the absence of a classical department, and in the greater attention given to those studies in the scientific course that pertain to agriculture and the arts. It differs also in the fact that it embodies with its liberal course of study practical training in the work of the shop and farm, its students being required to spend at least two hours of each day in labor, under the direction of their instructors. This manual labor is held to be beneficial by the financial aid it gives to the student; by instruction it gives in methods of work; by the health derived from regular, moderate exercise, and by the correct ideas imparted as to the dignity and importance of labor.

The work is in no sense intended as a means of raising revenue for the support of the College, and for that reason very little of the ordinary work of the farm is engaged in. Enough grain and hay is raised for the use of the College stock, but the chief work is to carry on experiments in irrigation, the culture of cereals, fruits, etc., with the view of determining questions of adaptability to soil and climate. From two to three hours are allotted to work on every afternoon, in which work all the students are expected to take part unless excused specially. Students are excused from work permanently, on the certificate of a physician, for physical disability. Students, for work during labor hours, are allowed pay at the rate of ten cents per hour.

FARM AND GROUNDS.

The College farm includes 240 acres, most of which is under cultivation, the work being chiefly experimental, and including the culture of trees, small fruits, cereals, garden vegetables, etc. The trees under successful cultivation include the standard varieties of the apple, pear, plum and cherry, and of forest trees—the ash, box elder, chestnut, elm, locust, maple and willow. The small fruits are represented by blackberries, currants, gooseberries, grapes, raspberries and strawberries.

The Floral Department is an interesting and attractive feature of the College. The grounds adjoining the building have been terraced and grassed, and adorned with the choicest varieties of shrubbery and flowers. The farm has been surveyed by an experienced landscape gardener, with a view to the irrigation of its highest portions, its division into fields and parks, and the setting out of fruit and forest trees.

READING ROOM.

The nucleus of a library has been obtained, and a Reading Room established, which has been supplied with the leading literary and scientific publications of the day. The following publications are on file:—American Agriculturalist, American Bee Journal, American Journal of Science, American Miller, American Naturalist. American Stock Journal, Appleton's Monthly, Colorado Farmer, Colorado Weekly Republican, Country Gentleman, Denver Daily News, Deaf Mute Index, Fort Collins Express, Fruit Recorder. Golden Globe, Greeley Tribune, Gardener's Monthly.

Harper's Monthly, Harper's Weekly, Industrialist (Kansas), Chicago Inter-Ocean, Journal of Chemistry, Longmont Ledger, N. Y. Nation, North American Review, Pacific Rural, Popular Science Monthly, Rural New Yorker, Scribner's Monthly, Scientific American Supplement, Western Rural.

LECTURES.

During the year, with the exception of the Winter term, a course of Sabbath afternoon lectures has been maintained. Members of the Faculty, ministers of various denominations and professional men have taken part in this Course, the popularity of which has been attested by the large attendance of students and citizens. Scientific lectures have been given by the professors weekly, to students in the various departments of study.

During the Winter vacation, the Board of Trustees and Faculty of the College organized and held a series of Farmer's Institutes at various points in the state. To give a clearer idea of the work at these institutes, we append a programme of places and topics: —Fort Collins, November 26 and 27, 1879, and December 9 and 10, 1880; Del Norte, December 30 and 31, 1879; Monument, January 2 and 3, 1880; Greeley, January 15 and 16, 1880; Longmont, February 5 and 6, 1880; Loveland, December 16 and 17, 1880; Denver, January 5 to 8, 1881. All the members of the Faculty attended these Institutes, and read papers or gave lectures on the following topics:—President Edwards, The Utility of Trees, Tree Culture, Relation of the Agricultural College to the State, Book Farming, and Hygiene of the Farm; Prof. A. E. Blount, Corn and Its Culture, Seeds, Wheat Culture, Injurious and Friendly Insects, Milling Properties of Wheat, Hybridization and Cross Breeding; Prof. F. J. Annis, Soils and Their Analyses, Relative Food Value of Flour, The Farmer's Home; Secretary H. Stratton, Dairying, Amber Cane. The following members of the Board furnished lectures on the annexed topics:—W. F. Watrous, Fruit Culture, Strawberries; B. S. La Grange, Construction of Ditches, Irrigation; J. S. Stanger, Relation of Grasses to Agriculture, Colorado as a Home for Farmers, Diversification and Marketing of Crops, The Necessity of Improved Farming; S. W. Horner, Irrigation; P. M. Hinman, Wheat.

These Institutes, though thus assisted by the members of the Board and Faculty, derived their chief interest and value from local contributions and discussions, based upon the experience and observation of resident farmers, embracing a wide range of topics, including everything of interest to the Colorado farmer. Most of the contributions have been published in the local papers.

SOCIETIES.

Connected with the College are a Literary Society and a Scientific Club. The exercises of the former consist of essays, declamations, select readings, debates and orations, and are an efficient means of improvement in writing and speaking and the management of deliberative assemblies. The Scientific Club engages in original investigation of phenomena, and is a valuable adjunct to the teachers of the College in the work of awakening thought and a spirit of investigation.

GOVERNMENT.

The government of the College is mild, but strict, the object of the President and professors being not so much to govern directly as to teach the students how to govern themselves. It is thought best to appeal to the student's sense of justice and propriety, rather than to govern by force. If students cannot be reached by such appeals, their presence in the institution is not desirable, and they will be privately dismissed.

The Faculty may enact and announce from time to time such rules and regulations as may be thought necessary for the government of the students in the College building and in the Boarding Hall.

GENERAL RULES AND REGULATIONS.

Students are admitted to recitation only after matriculation and enrollment.

The Literary and other societies connected with the College are under the control of the Faculty, and no organization, society or club will be permitted in the College except by consent of the Faculty.

Students are not permitted to absent themselves from the College or recitation without excuse from the President or Faculty.

Students are not permitted to frequent saloons, or other places where intoxicating liquors are sold.

Students are expected to remain in their rooms during study hours.

Smoking and chewing tobacco are prohibited on the College premises.

Students are amenable to College discipline at all times and places during their connection with the College.

Students are not permitted to take studies not taught in the College, or taught by persons not connected with the College, unless by permission of the Faculty.

EXPENSES.

Tuition is free to all students.

A matriculation fee of five dollars and an incidental fee of one dollar, at the beginning of each term, entitles the student to the privileges of the whole course.

Room rent for each student is one dollar a term, paid in advance. Rooms are furnished with bedsteads and stoves; students furnish everything else—beds, pillows, bedding and furniture.

Board at the College Boarding Hall—where students are required to board, unless permitted by the faculty to room and board elsewhere,—is furnished at actual cost. All expenses of keeping up the dining hall, heating the rooms, sweeping and lighting the halls, and annually cleaning the halls, are included in the charge for board. This being the first term since the Boarding Hall has been established, the State Board of Agriculture has decided that the price shall not exceed three dollars per week.

The Boarding Hall will be under the supervision of some member of the Faculty at all times. Students will be required to observe the rules of the Boarding Hall.

Students will be required to advance twelve dollars on board at the beginning of each term.

THE FUTURE.

No pains will be spared by the Board or Faculty to make the institution one of the best of its class. Buildings will be added from time to time and new professorships created, as the necessities of the school may demand, and as rapidly as the means within the control of the Board will permit. It is in contemplation, as soon as practicable, to make the school more effective by the establishment of a Mechanical Department, for the instruction of students in the Mechanic Arts.

CALENDAR.

1881-1882.

FALL TERM. { Commences, September 19th, 1881.
Closes, December 9th, 1881.

WINTER TERM. { Commences, January 16th, 1882.
Closes, April 7th, 1882.

SPRING TERM. { Commences, April 17th, 1882.
Closes, July 7th, 1882.

The opening of the Fall Term has been changed from August 29th, the stated time, to September 19th, in consequence of the non-completion of the Boarding Hall at the former date, and in order to accommodate students from a distance who may wish board and lodging in the Hall. The change will not extend beyond the present year.

REGISTER

OF THE

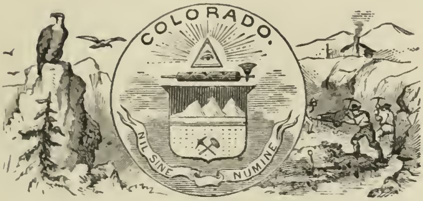
OFFICERS AND STUDENTS

AND

COURSES OF INSTRUCTION

IN THE

STATE AGRICULTURAL COLLEGE.



1881-82--1882-83.

Fort Collins, Colo.:
COURIER BOOK AND JOB PRINTING HOUSE.
1883.

MEMBERS OF

STATE BOARD OF AGRICULTURE.

	Term Expires.
Hon. B. S. LaGrange, Greeley, -	February, 1891.
Hon. W. F. Watrous, Fort Collins, -	" 1891.
Hon. John J. Ryan, Loveland, -	" 1889.
Hon. Henry Foote, Del Norte, - -	" 1889.
Hon. David Boyd, Greeley, - -	" 1887.
Hon. Ozro Bracket, Frankstown, -	" 1887.
Hon. R. A. Southworth, Denver, -	" 1885.
Hon. P. M. Hinman, Ni Wot, - -	" 1885.
His Excellency, Gov. James B. Grant, President, Charles L. Ingersoll,	*Ex-officio.*

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OFFICERS OF STATE BOARD.

Hon. David Boyd, - - - - - *President.*
Hon. John J. Ryan, - - - - *Secretary.*
Hon. Fred. Walsen, (*ex-officio*), - - - *Treasurer.*

COMMITTEES.

FINANCES.

W. F. Watrous, O. Bracket, John J. Ryan.

FARM AND EXPERIMENTAL GROUND.

B. S. LaGrange, P. M. Hinman, O. Bracket.

HORTICULTURE AND GROUNDS.

W. F. Watrous, R. A. Southworth, Henry Foote.

COLLEGE BUILDINGS.

B. S. LaGrange, Henry Foote, W. F. Watrous.

VETERINARY SCIENCE AND STOCK.

R. A. Southworth, O. Bracket, John J. Ryan.

MECHANICS AND CHEMISTRY.

P. M. Hinman, Henry Foote, O. Bracket.

MATHEMATICS AND ENGINEERING.

John J. Ryan, B. S. LaGrange, R. A. Southworth.

FACULTY, TEXT-BOOKS AND COURSE OF STUDY.

Henry Foote, R. A. Southworth. P. M. Hinman.

FACULTY.

1881-82.

*E. E. EDWARDS, Ph. D.,
President, and Professor of Moral and Mental Science.

A. E. BLOUNT, A. M.,
Professor of Experimental Agriculture and Mechanic Arts.

CHARLES F. DAVIS, B. S.,
Professor of Chemistry and Mathematics.

P. M. HINMAN,
Secretary, Farm Manager, Superintendent Horticultural Department.

MRS. A. E. BLOUNT,
Superintendent of Floral Department.

MRS. P. M. HINMAN,
Matron of Boarding Hall.

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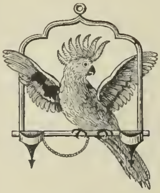
*Resigned April 7th, 1882.



REGISTER OF STUDENTS.

1881-82.

Abbott, Albert D.,	Fort Collins,	Colo.
Abbott, Frank D.,	“	“
Bell, William G.,	“	“
Black, David A.,	“	“
Braley, John N.,	“	“
Bristol, Wilton P.,	“	“
Budd, Harry S.,	“	“
Budrow, Frank,	“	“
Carpenter, George S.,	“	“
Carpenter, Harry,	“	“
Carter, Anna,	“	“
Chaffee, Frank,	“	“
Clark, Lillie,	Loveland,	“
Coffin, Gertrude,	Fort Collins,	“
Coffin, Mark A.,	“	“
Cotton, Clara,	“	“
Coy, Libbie,	“	“
Coy, William B.	“	“
Crouse, Thomas H.,	Colorado Springs,	“
Davis, Charles K.,	Highland Lake,	“
Edwards, Elmer E.,	Fort Collins,	“
Edwards, Eddie M.,	“	“
Edwards, Mary O.,	“	“
Emigh, Florence,	“	“
Fertig, Maggie,	“	“

Fletcher, Violet,	Fort Collins,	Colo.
Gifford, Mary J.,	Loveland,	"
Gifford, William F.,	"	"
Glover, George,	Longmont,	"
Handy, Cornelia R.,	Loveland,	"
Harris, Maggie,	Fort Collins,	"
Hice, Edna,	"	"
Kelly, Frank B.,	Chugwater,	Wyoming T.
Kern, Attie,	Fort Collins,	Colo.
Kilburn, Montie,	Loveland,	"
Lindenmeier, William,	Fort Collins,	"
Loomis, Lelia,	"	"
Loomis, Leonidas,	"	"
Lyon, Hannah,	"	"
Lyon, Mary,	"	"
Mandeville, Grace P.,	"	"
McCarroll, Robert,	"	"
Maxwell, Anna,	Chugwater,	Wyoming T.
Markham, Jennie F.,	Fort Collins,	Colo.
Marsh, Edith E.,	"	"
McClelland, Elmer,	"	"
McClelland, Frank A.,	"	"
McIntyre, Ola,	"	"
McLain, Ernest,	"	"
Nicholas, Alfred M.,	"	"
Nixon, Samuel M.,	"	"
Overholt, Edward S.,	Del Norte,	"
Overholt, George W.	"	"
Patton, Grace,	Fort Collins,	"
Patton, Knud,	"	"
Porter, Joseph A.,	———————,	Ills.
Post, Frederick Edward,	Fort Collins,	Colo.
Roberts, Charles,	Livermore,	"
Roberts, George,	"	"

Ryan, Charles,	Loveland,	"
Ryan, Hattie,	"	"
Ryan, John H.,	"	"
Ryckman, Virginia,	Brady,	Pa.
Schmutz, Barbara,	Omaha,	Neb.
Secord, Cortland,	Fort Collins,	Colo.
Sherman, Albert L.,	Evans,	"
Sherman, Anna L.,	"	"
Sickman, Lora B.,	Fort Collins,	"
Sickman, Wilbert J.,	"	"
Soult, William E.,	"	"
Stewart, Arthur L.,	Rustic,	"
Stewart, M. E.,	"	"
Stewart, Ulysses S.,	"	"
Sullivan, Sophronia,	Loveland,	"
Thomas, Effie,	Fort Collins,	"
Throckmorton, Clara,	"	"
Trimble, Robert,	"	"
Watrons, Frank,	"	"
White, Helen,	"	"
Wilson, Lillie D.,	"	"
Woodruff, Ben. F.,	Virginia Dale,	"

Total, 81.

* FACULTY.

1882-83.

Charles L. Ingersoll, M. S.,
President, Professor of Political Economy and Logic.

Ainsworth E. Blount, A. M.,
Professor of Agriculture and Botany, and Superintendent of Farm.

Charles F. Davis, B. S.,
Professor of Chemistry and Physics.

Elwood Mead, B. S.,
Professor of Mathematics and Engineering.

James Cassidy,
Instructor in Horticulture, Superintendent of Department.

James W. Lawrence,
Professor of Mechanics and Drawing.

George C. Faville, B. S., D. V. M.,
Professor of Veterinary Science and Zoology.

Mrs. C. L. Ingersoll,
Matron of Ladies' Dormitory.

Hon. John J. Ryan,
Secretary of the Board and Faculty.

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* Faculty as at present constituted. Prof. James W. Lawrence, on March 21st, 1883, took the place made vacant by resignation of Prof. Frank H. Williams. Hon. P. M. Hinman was succeeded by Hon. J. J. Ryan; his term of office expired February 20th, 1883.

REGISTER OF STUDENTS.

1882-83.

POST GRADUATE.

Joseph A. Briggs, B. S., L. L. D., - - Denver, Colo.
Agricultural Chemistry.

SENIOR CLASS.

The College, not being opened for instruction until September, 1879, is yet too young to have a Senior Class, in the regular sequence of time.

JUNIOR CLASS.

Coy, Libbie, - - - -	Fort Collins,	Colo.
Glover, George H., - - -	Longmont,	"
	(Residence, Weld County.)	
Loomis, Leonidas, - - -	Fort Collins,	"
McClelland, Elmer, - - -	"	"
Watrous, Frank, - - -	"	"

Total, 5.

SOPHOMORE CLASS.

Blinn, Cora B., - - -	Berthoud,	Colo.
Coffin, Gertrude, - - -	Fort Collins,	"

Emigh, Florence,	Fort Collins,	Colo.
Flinn, Anna E.,	Loveland,	"
Hice, Edna,	Fort Collins,	"
Loomis, Lelia,	"	"
Marsh, Edith E.,	"	"
Patton, Grace,	"	"
Ryan, John H.,	Loveland,	"
Ryckman, Virginia,	Brady,	Pennsylvania
Trimble, Robert,	Fort Collins,	Colo.
Vail, George,	Boulder,	"
White, Helen,	Fort Collins,	"

Total, 13.

FRESHMAN CLASS.

Abbott, Albert D.,	Denver,	Colo.
Akin, John S.,	Fort Collins,	"
Black, David A.,	"	"
Budd, Harry S.,	Poudre Canon,	"
Coffin, Mark A.,	Fort Collins,	"
Coy, William B.,	"	"
Davis, Thomas L.,	"	"
Driscoll, William M.,	Aylmer,	Canada
Foster, Agnes E.,	Fort Collins,	Colo.
Gifford, Mary J.,	Loveland,	"
Gifford, William E.,	"	"
Holcomb, William H.,	"	"
Kilburn, Montie,	"	"
McCarroll, Robert,	Fort Collins,	"
Nettleton, Edwin G.,	Denver,	"
Rist, Charles E.,	Loveland,	"
Ryan, Charles,	"	"
Shay, Clark W.,	"	"
Sickman. Wilbert J.,	Fort Collins,	"

Stewart, Ulysses S.,	Rustic,	“
Virden, Marietta,	Saguache,	“

Total, 21.

PREPARATORY CLASS.

Baldwin, Willie A.,	Denver,	Colo.
Ballard, H. W.,	Fort Collins,	“
Bartholf, J. Harvey,	Loveland,	“
Barrett, Thomas,	Denver,	“
Bristol, Wilton P.,	Fort Collins,	“
Budrow, Frank,	“	“
Carr, Charles E.,	Loveland,	“
Clark, Anna O.,	Rustic,	“
Coffman, Elbert G.,	Longmont,	“
Cotton, Clara,	Fort Collins,	“
Gill, Nellie F.,	“	“
Gifford, George H.,	Loveland,	“
Gifford, Sarah F.,	Jamestown,	“
Handy, Lillie E.,	Fort Collins,	“
Hilton, Harvey,	“	“
Hoyt, Fred W.,	“	“
Lindenmeier, William,	“	“
Lyon, Aggie L.,	“	“
McKinley, Thomas W.,	“	“
McKissick, Alice,	“	“
McKissick, Nettie,	“	“
McKissick, Oliver,	“	“
Peterman, Dora E.,	“	“
Pound, Albert L.,	Highland Lake,	“
Secord, Cortland,	Fort Collins,	“
Soult, William E.,	“	“
Stratton, Daisy E.,	“	“
Vollentine, Mabel,	“	“

Van Brunt, Charles W.,	Fort Collins,	Colo.
Wetzler, Charles L.,	Livermore,	“

Total, 31.

SPECIAL STUDENTS.

Handy, Cornelia R.	Fort Collins,	Colo.
Handy, Willie P.,	“	“
Kern, Attie,	“	“
Lyon, Hannah,	“	“
Mahan, T. B.,	“	“
Mandeville, Grace P.,	“	“
Nixon, Samuel M.,	“	“
Patton, Knud,	“	“
Turner, Ernest,	Denver,	“
Van Brunt, M. I.,	Fort Collins,	“

Total, 10.

RECAPITULATION.

1881-2.

Total students enrolled,	81

1882-3.

Post Graduate,	1
Senior Class,	0
Junior Class,	5
Sophomore Class,	13
Freshman Class,	21
Preparatory Class,	31
Students in Special Studies,	10
Total students enrolled,	81

1881-2.

Gentlemen,	49
Ladies	32
Total,	81

1882-3.

Gentlemen,	50
Ladies,	31
Total,	81

COLORADO

AGRICULTURAL COLLEGE CADETS.

OFFICERS.

Captain, - - - - - Prof. C. L. Ingersoll
First Lieutenant, - - - - - - L. Loomis
Second Lieutenant, - - - - - J. H. Ryan

SERGEANTS.

Glover, G. H.,
Stewart, U. S.,
Trimble, R.,
Sickman, W. J.,
Nettleton, E. G.

CORPORALS.

Shay, C. W.,
Ryan, C.,
Hoyt, F. W.,
Secord, C.,
Davis, T. L.,
Driscoll, W. M.

PRIVATES.

Abbott, A. D.,
Akin, J. S.,
Baldwin, W. A.,
Ballard, H. W.,
Barrett, T.
Bartholf, J. H.,
Black, D. A.,
Holcomb, W. H.,
Kilburn, M.,
Lindenmeier, W.,
McCarroll, R.,
McClelland, E.,
McKinley, T. W.,
McKissick, O.,

Bristol, W. P.,
Budd, H.,
Budrow, F.,
Carr, C. E.,
Coffin, M. A.,
Coffman, E. G.,
Coy, W. B.,
Gifford, G. H.,
Gifford, W. F.,
Handy, W. P.,
Hilton, H. W.,
Nixon, S. M.,
Patton, K.,
Pound, A. L.,
Rist, C. E.,
Soult, W. E.,
Turner, E.,
Vail, G.,
Van Brunt, C. W.,
Van Brunt, M. I.,
Watrous, F.,
Wetzler, C. E.

Total, 36.

COLORADO AGRICULTURAL COLLEGE.

COURSE OF STUDY AND LABOR.

PREPARATORY YEAR.

FIRST TERM.

Arithmetic,	Thompson
U. S. History,	Ridpath
Physical Geography,	Houston
English Analysis,	Kellogg

Labor, two hours, farm and garden.

SECOND TERM.

Arithmetic,	Thompson
U. S. History, six weeks,	Ridpath
Elocution, six weeks,	Fenno
Physical Geography, six weeks,	Houston
Elementary Physiology, six weeks,	Hutchinson
English Analysis,	Kellogg

Labor, two hours, shop practice.

THIRD TERM.

Elementary Algebra,	Olney
Elocution,	Fenno
Elementary Physiology,	Hutchinson
Word Analysis,	Swinton

Labor, two hours, farm and garden.

FRESHMAN YEAR.

FIRST TERM.

Geometry,	Wentworth
Elementary Rhetoric,	Kellogg
Drawing,	Lectures and practice
Agriculture,	Lectures

Labor, two hours, farm and garden.

SECOND TERM.

Geometry,	Wentworth
Book Keeping,	Meservey
Drawing,	Lectures and practice
Botany,	Gray

Labor, two hours, shop practice.

THIRD TERM.

Algebra,	Olney
Drawing,	Lectures and practice
History, (Ancient),	Swinton
Botany,	Gray

Labor, two hours, farm and garden.

SOPHOMORE YEAR.

FIRST TERM.

Algebra,	Olney
History,	Swinton
Drawing,	Lectures and practice
Elementary Chemistry,	Lectures

Labor, two hours, laboratory practice.

SECOND TERM.

Trigonometry, six weeks,	Wentworth
Surveying, six weeks,	Gillespie
English Literature,	Shaw
Drawing,	Lectures and practice
Organic Chemistry, six weeks,	Lectures
Zoology, six weeks,	Packard

Labor, two hours, shop practice.

THIRD TERM.

General Geometry,	Olney
English Literature,	Shaw
Drawing,	Lectures and practice
Zoology,	Packard

Labor, two hours, field surveys, leveling and platting.

JUNIOR YEAR.

FIRST TERM.

Physics,	Snell's Olmstead
Rhetoric,	Bain
Geology,	Le Conte
Agricultural Chemistry,	Johnson

Labor, two hours, chemical analysis.

SECOND TERM.

Physics,	Snell's Olmstead
Floriculture and Gardening,	Lectures
Anatomy and Physiology,	Lectures,—Martin
Agricultural Chemistry,	Johnson

Labor, two hours, chemical analysis.

THIRD TERM.

Microscopy,	Lectures and Practice
Horticulture,	Lectures,—Thomas
Physiology,	Martin.
Entomology,	Lectures

Labor, two hours, conservatory, etc.

SENIOR YEAR.

FIRST TERM.

Chemical Physics,	Miller
Agriculture,	Lectures
Veterinary Science,	Law and lectures
Psychology,	Porter

Labor, two hours, shop practice.

SECOND TERM.

Meteorology,	Lectures
Astronomy,	Loomis
Veterinary Science,	Law and lectures
Logic,	Fowler

Labor, two hours, shop practice.

THIRD TERM.

Moral Science,	Fairchild
Landscape Gardening,	Kemp
U. S. Constitution,	Young and lectures

Labor, two hours, shop practice.

COURSE OF INSTRUCTION
AND LABOR.

PREPARATORY YEAR.

1st Term,	Arithmetic.	U. S. History.	20 weeks.	Phys. Geography.	20 wks.	English Analysis.	Labor on farm, 2 hours.
2d “	“	“ “ Elocution.	16 weeks.	“ “ El. Physiology.	16 wks.	“ “	Shop practice, “
3d “	El. Algebra.	“		“ “		Word “	Labor on garden, “

FRESHMAN YEAR.

1st Term.	Geometry.	El. Rhetoric.	Drawing.	Agriculture Lectures.	Labor on farm, 2 hours.
2d “	Geometry, completed.	Book Keeping.	“	Botany.	Shop practice, “
3d “	Algebra.	History (Ancient).	“	“	Labor on farm, “

SOPHOMORE YEAR.

1st Term.	Algebra, completed.	History (Con.)	Drawing.	El. Chemistry.	Laboratory practice, 2 hrs.
2d “	Trigonometry. Surveying.	English Literature.	“	Organic Chemistry. Zoology	Shop practice, “
3d “	General Geometry.	“ “	“	Zoology.	Field Surveys and Levels.

JUNIOR YEAR.

1st Term.	Physics.	Rhetoric.	Geology.	Agricult'l Chemistry.	Chemical Analysis, 2 hours Lab. work.
2d “	“	Floriculture.	Anatomy, 6 weeks. Physiology, 5 weeks.	“ “	
3d “	Microscopy.	Horticulture.	Physiology,	Entomology.	Labor on garden, 2 hours.

SENIOR YEAR.

1st Term.	Chemical Physics.	Agriculture, lectures.	Veterinary Science.	Psychology.	Mechanics, 2 hours shop practice.
2d “	Meteorology.	Moral Science.	“ “	Logic.	
3d “	Astronomy.	Landscape Gardening.	U. S. Constitution.	Political Economy.	

DEPARTMENTS OF
INSTRUCTION AND LABOR.

AGRICULTURE.

THE study is pursued by a course of lectures in the first term of the Freshman year, in which are discussed the various breeds of horses, cattle, sheep, swine and poultry; their peculiarities, history, adaptation, etc., etc.; also, herd-books, their growth and history; pedigrees, their variation in form in different herd-books, means of tracing and detecting errors in record. Families in different breeds are discussed, and the origin of families and family names fully explained.

In the Senior year, the student is given more instruction in this line after he has pursued thoroughly those branches of science which underlie or are closely related to Agriculture. Lectures are given in stock-breeding, erection of farm buildings and farm economy, including a thorough discussion of the principles governing the rotation of crops. Other topics will be discussed which are of vital importance to the agriculturist.

Students labor upon the farm and at the experimental ground two hours daily on each school day. "Labor and study, theory and practice go hand in hand. To know how and when to do work well is a science; to acquire the skill is an art. That they may obtain the science, study is necessary; to get the art, work is indispensable."

BOTANY.

The instruction in Botany is very full and complete, commencing with the study of vegetable physiology and proceeding to structural and systematic botany. After a thorough study of principles, the students are required to study the plants, and in this way to fix in their minds the principles before so thoroughly scanned. Two terms of the Freshman year are devoted to the foregoing work. The new greenhouse, to be completed by July 1st, 1883, will furnish ample material for work, and, distributed over a large number of botanical families, our facilities for instruction in this branch are unsurpassed. In the last term of the Junior year, the students take up the work of microscopy, in which the study of histology is pursued. Many plants and organs are examined by section, and the student required to make drawings of the same. In this manner, the student becomes prepared to go on and make independent investigations in various directions.

CHEMISTRY.

It is the object of this department to give the student an opportunity to acquire a thorough mastery of the elementary principles of the chemical science. To attain this object, the theory and practice are made to go hand in hand. In the first term of the Sophomore year, the class listens to a series of lectures upon the general theory of the science, its history and development. In this course of lectures are discussed the subjects of acids, bases and salts, and the principles of the chemical philosophy. The nature, history and compounds of each of the elements are discussed in detail, the whole being enforced by numerous experiments. While taking this course, the student spends two hours each day in the work-room, repeating the experiments shown in class, and others which may be suggested, and prepares a series of substances by the synthetic process. This labor serves to familiarize the student with various forms of crystals, the marked distinction between various classes of salts, the use of the nomenclatures, and the manipulation of apparatus.

For the last five weeks of the term, the two hours in the work-room are devoted to the practice of Blowpipey and the elements of mineralogy.

In the second term of the Sophomore year, there is given a course of lectures on Organic Chemistry, continuing for six weeks, one hour daily.

In the first two terms of the Junior year the student listens to a course of lectures upon Agricultural Chemistry, in which are discussed such subjects as the following: relation of Chemistry to Agriculture; the literature of Agricultural Chemistry; elements of plant growth, their relative abundance and importance; the atmosphere, the soil, fertilizers, etc.

During these terms the class spend two hours daily in the work-room, where they pursue the study of qualitative analysis, by precipitation, and a short practice in volumetric analysis. The student will also make a few determinations quantitatively of the relative ash of plants; the water and organic matter of plants, and at least one ultimate analysis of soil.

Keeping in mind the objects for which our college is founded, we have so planned our chemical course as to prepare the student for the general application of chemistry in its relation to the industrial arts, while seeking especially to thoroughly ground him in the application of the science to Agriculture.

PHYSICS.

The study of Mechanical and Chemical Physics will continue for three terms. The first term will be devoted to the study from text-book of the mechanics of solids. The second term will be given to the subjects of Hydrostatics, Pneumatics, Acoustics and Optics, by lecture. In the last term will be given the subjects of Heat, Electricity and Magnetism, from the standpoint of Chemical Physics. The whole study of Physics will be illustrated, where practicable, by apparatus and experiment.

METEOROLOGY.

In the second term of the Senior year the student listens to a course of lectures upon Meteorology, in which he hears discussed the nature of the atmosphere and atmospheric phenomena; the general circulation of the air, variable winds, cyclones, tornadoes and hurricanes; laws of storms and circulation of oceanic waters; the work of the U. S. Signal Service Bureau, and the manner of taking observations, with a discussion of the principles involved.

HORTICULTURE.

Instruction in the several branches of Horticulture is given as follows: In practical Floriculture, by lectures upon such topics as the construction, heating and management of greenhouses; the propagation of plants by seeds, cuttings, layers, budding and grafting; how budding and grafting is done, and its uses; the cultivation and general management of greenhouse plants for commercial or private purposes; insects and diseases of plants under glass, with remedies therefor; parlor gardening, Wardian cases, and ferneries; arrangement of flowers in boquets and floral designs.

Instruction in Fruit Culture is given by lectures, and embraces a theoretical and practical study of the propagation, planting, pruning and general management of orchards and small fruit gardens; insect enemies, diseases, and varieties best adapted to this latitude; clasification of fruits by form, habit of growth, flowers and leaves.

VEGETABLE CULTURE comprises kitchen and market gardening, and seed growing; and the principal topics considered, are the best situation for, and the laying out of the garden with a view to its irrigation, and most economical management in the rotation and planting of crops for the family and for market; management of composts and commercial fertilizers; care of tools; selection and growing of seeds; construction, management and uses of hot-beds and cold frames; harvesting, marketing, and storing of fruits and vegetables.

FORESTRY is taught by lecture, special attention being given to such topics as the value of trees and shrubs for timber and ornament, for hedges, screens, and shelter belts for this state; the best methods of culture, with a history of varieties, especially such as are thought worthy of trial in this latitude.

LANDSCAPE GARDENING is taught in the Senior year by the regular study of a text-book: Kemp's "How to Lay Out a Garden," adapted as much as possible to the exigencies of this climate; frequent use being made of the grounds, and their planting, for illustration. The orchards, nursery, greenhouse, vegetable garden, and flower garden afford ample opportunity to the student to acquire a practical acquaintance with the above topics.

MATHEMATICS.

THE instruction offered by this department is designed to conform to the general aim and purpose of the institution, accordingly, only those branches of pure mathematics are taught, which the student will find of greatest service in after life. The instruction in this portion of the subject being about the same as that of Classical Colleges, while the attention given to applied mathematics, including surveying and engineering, is much greater than that of the usual College course.

ARITHMETIC.—Students entering the Preparatory year in the first and second terms pay special attention to decimal notation and general analysis, covering the several departments of Commercial Arithmetic.

ALGEBRA.—The study of Algebra occupies the last term of the Preparatory year, the third term of the Freshman, and the first term of the Sophomore years. In the first term the principal object is to thoroughly familiarize the pupil with the use of literal quantities and the processes of factoring. The second term's work is largely devoted to the study of the equation, and its uses in the solution of intricate problems in interest, common discount and alligation, and for the demonstration of geometrical and trigonometrical theorems. The last term is given to Higher Algebra. Through this study two objects are kept prominently in view: first, to give the pupil facility in the use of algebraic processes, and second, to train him to methods of reasoning rather than operating.

GEOMETRY is studied the first and second terms of the Freshman year—Plane Geometry occupying the first term and Solid Geometry about nine weeks of the second. The remainder of the term will be taken up by a series of exercises in Modern Geometry. Problems in mensuration and original exercises will be added to the routine text-book work, giving the student frequent practice in the application of principles already acquired, and enabling him to fix more firmly the knowledge gained.

TRIGONOMETRY AND SURVEYING occupy the second term of the Sophomore year. The first six weeks are devoted to the study of Trigonometry, enabling the student to master the principles involved in Mensuration and Surveying.

The instruction in Surveying will be in part by lectures, and includes theory, adjustment and use of instruments, history and methods of U. S. Government surveys, measurement and division of lands, the establishment of levels and grades, platting and computation of earthworks.

During the third term of the Sophomore year, the students in Surveying will be required to devote from two to three hours, daily, to field practice, measuring areas, laying out ditches, etc. They will take their own notes, from which they will be required to submit computations, accompanied by drawings made to scale.

GENERAL GEOMETRY.—The study of General Geometry will be pursued during the third term of the Sophomore year. In this time, the students complete a somewhat extended course in Plane Co-ordinate Geometry, in addition to which there will be given a series of lectures illustrating its application in determining the laws of mechanics.

ASTRONOMY.—Senior students pursue the study of Astronomy during the third term of that year. It will be chiefly descriptive.

PRACTICAL MECHANICS.

THE old system of apprenticeship is rapidly becoming a thing of the past, and it is now almost impossible for a boy to learn a trade in any modern shop or factory. This is owing, largely, to the introduction of special machinery, necessitating special workmen to manage it, and the workman who has learned to run a machine of this kind is kept at that work, as being most profitable to his employer; his practical knowledge of other methods and machines is, therefore, confined to narrow limits, and, should a vacancy occur in a superior position, he is not the man for the place, from the fact of his being unacquainted with other practical parts connected with his trade, the manipulations and principles involved in which he has not had an opportunity to learn.

This department has for its object a systematic and progressive education in the use of tools and materials, combined with as much theoretical knowledge as shall be deemed necessary to properly explain the principles involved. It does not teach special trades, nor manufacture salable articles; to do so would require that the student be kept on the kind of work he could do best, and thus prevent him from acquiring broad and liberal ideas of other methods. So without teaching any one complete trade, the mechanical principles of many are gained. This does not necessarily mean that the student becomes sufficiently expert to compete with the skilled mechanic, but that a knowledge of *how* a tool or machine should be used, and the manner of *laying out work* for the same, is thoroughly taught.

Although it is not expected that all students are to become mechanics, yet such a training cannot but make its salutary effects felt in whatever walk of life he may choose.

Should his surroundings be such that he enters manufacturing, his ideas having been broadened by this training, he will the more readily grasp anything new that may come up in his business, or if he takes up farming, he will with greater ease, be able to understand the mechanical principles and workings of his machinery, and also how to keep them and his buildings in proper repair.

The shop instruction will be divided in courses as follows, and in each course will be given, in connection with the work, an explanation of the construction of each tool, its manner of acting on the material, and methods of determining how to select materials best suited to different kinds of work, and manner of laying out work, cutting speed of tools, etc.

COURSE OF LABOR.

Bench work in wood, - -	12 weeks	1st year.
Machine work in wood, - -	4 weeks	
Pattern making and foundry work,	12 weeks	
Vise work in iron, - - -	10 weeks	
Iron forging, - - -	14 weeks	2d year.
Steel forging, - - -	4 weeks	
Machine work in iron, -	20 weeks	

BENCH WORK IN WOOD.—This course will consist of exercises with the different wood working bench tools, so arranged in a graded series as to embrace the manipulation of the tools in their various applications.

First.—The use of the planes in jointing, smoothing and getting the piece out of wind, lining off, and the use of the saws in cutting across and with the grain and keeping to line.

Second.—Halved splice.

Third.—Splayed splice.

Fourth.—Keyed splice.

Fifth.—Open dovetail mortise and tenon joint.

Sixth.—Mortise and tenon joint.

Seventh.—Open dovetail joint.

Eighth.—Blind dovetail joint.

Ninth.—Lap joint.

Tenth.—Dowel joint.

Eleventh.—Small newel-post with hand-worked rail.

Twelfth.—Panel door.

Thirteenth.—Roof Truss.

Fourteenth.—Box.

Fifteenth.—Carpenter's trestle.

MACHINE WORK IN WOOD.—In connection with this course, with the use of tools, will be given the most rapid and economical method of selecting and preparing the wood for the machine.

There will be given examples of

First.—Straight turning.

Second.—Cutting-in and squaring-off.

Third.—Convex, concave and compound curves.

Fourth.—Handles for chisels and other tools.

Fifth.—Examples in chuck-work in separate and combined pieces.

Sixth.—How to turn a ball.

Some of these pieces will be used in connection with ornamental scroll-sawing.

PATTERN MAKING AND FOUNDRY WORK.—After becoming familiar with bench and machine work in wood, an application of both is made, by constructing patterns with due regard to shrinkage, draft and the best method of constructing the pattern, so that it cause the least amount of trouble in the foundry.

There will be given examples of

Plain work.

Core work.

Pulley work.

Pipe work.

Gear work.

Core boxes, their uses and construction.

And in the foundry will be given practice in moulding in plain and core work and management of the furnace and core-oven.

VISE WORK IN IRON.—With this course will be given an explanation of the different kinds of tools and their effect on the material, and the style of tool to be selected for certain kinds of work.

There will be given examples in

Chipping cast iron, wrought iron and steel.

Spline chipping.

Hack sawing.

Filing square and round surfaces to line.

Shoulder, point and other free-hand filing.

Fitting joints.

Finishing and scraping.

FORGING IN IRON AND STEEL.—Care of the fire.

The effect of different heats on the material.

Drawing, upsetting, bending.

Scarf, fork, jump and other styles of welding.

Welding iron to iron, iron to steel, steel to steel.

Rings, chains, ring-bolts, brackets, braces, heading-tools, nails, bolts, hooks, hasps, swivels, tongs.

Steel wrenches, cold chisels, drills, lathe tools, springs, etc.

Examples in tempering and case-hardening.

MACHINE WORK IN IRON.—Care of the machines, their construction, proportion and use of the different parts.

Cutting speed of tools, and proper angle of cutting edge for different purposes and different metals.

Centering and straightening work.

Straight turning and squaring.

Boring.

Making and fitting joints.

Chuck-work.

Screw-cutting inside and outside.

Drilling, tapping and reaming.

Boring with boring-bar and use of center rest.
Polishing and finishing.
Hand-tool work.

DRAWING.

FIRST YEAR.

Geometrical problems.
Freehand copy and dictation.
Designs.
Linear perspective.
Model and object drawing.

SECOND YEAR.

Orthographic and Isometric projections, and projection of shadows.

Development and intersection of surface.
Light and shade.
Historical ornament.
Wood carving, diaper, incised and relief.
Ornamentation of pottery, titles, etc.

VETERINARY SCIENCE.

The opening of the year of 1883-4 will see the introduction of a department of Veterinary Science, with a full D. V. S. in charge. Instruction will be given in this department by means of lectures upon causes and nature of diseases, their symptoms and treatment; also, upon the nature, action and power of medicines, and the filling of prescriptions in actual practice. For the better illustration of the subject to the classes, weekly clinics will be held, at which animals will be treated free of all charge, except for medicine and care; medical and surgical attention absolutely free. The study of these subjects is taken up for two terms of the Senior year. The same Professor will give the instruction in

PHYSIOLOGY AND COMPARATIVE ANATOMY.

The study of the Elements of Physiology is commenced in the second term of the Preparatory year, and continued sixteen weeks. The more thorough study is begun in the second term of the Junior year, lectures being given on Anatomy, and followed by a thorough study of Physiology. Martin's "Human Body" is used as text-book, supplemented by lectures.

ZOOLOGY.

This branch of study is begun in the middle of the Sophomore year, and continued for sixteen weeks. The class begin with the lower forms, and, passing to the higher, spend the latter part of the study on Vertebrates. The College has skeletons and other material in the Zoological museum to illustrate the study quite fully.

ENTOMOLOGY.—This branch of Zoology is studied more completely in a course of lectures in the Junior year, in which the subject of bee-keeping receives especial attention. The instruction deals largely, after the grouping and classification are disposed of, with the study of those species and genera of insects which are either beneficial or injurious to the agriculturist. In this connection are discussed the various known means and remedies of checking the ravages of those injurious. Some laboratory work will be required of each student.

ENGLISH.

The study of this branch is begun as a review of English

Analysis, carried over two terms. This is followed by one term of Word Analysis, thus making one continuous line of study during the whole Preparatory year.

RHETORIC.

Elementary Rhetoric is studied during the first term of the Freshman year. Students are required to write and submit essays weekly, during the course. In the Junior year the study is continued through the fall term, when more advanced features of the study and discussions on the same take place.

HISTORY AND LITERATURE.

Ancient history is commenced in the last term of the Freshman year. Text-book and essays on special topics constitutethe course. The study of medieval and modern history is continued in the first term of the next year. The aim of this course is to impress on the mind the importance of the study and its bearing on the study of the

LITERATURE.—English literature is studied from text-book and by critical readings of selections from leading authors of the various epochs or periods. This study is pursued two terms.

MENTAL AND MORAL SCIENCE

Are studied in the Senior year, so as to give a good out line in each, which the student is expected to fill in largely by supplementary readings.

LOGIC.

The study of this branch is considered of prime importance, as in the presentation of the inductive we find the methods pursued for the advancement of science and the means of elimination of error from experiment. The deductive method is only expanded sufficiently to give the student a good idea of its divisions and their uses.

POLITICAL ECONOMY.

Wayland, lectures and discussions, are used. The short term only gives sufficient time to arouse an interest in the divisions of the subject and lead the student to read and act intelligently on the questions which interest us as a nation in our growth and increase of wealth.

The study of the Constitution of the United States and of the State of Colorado, in a previous term, all conjoin to make more broad the mind of the student and the better fit him to take his place among the citizens of the state.

EXPENSES.

Matriculation, (entrance fee, entitling the student to the privileges of the whole course), -	$5 00
Incidental fee, per term, - - - - -	1 00
Board in dormitory (including room rent, heat and light), per week [about cost] - - -	3 35
Tuition free.	

Washing averages about 75 cents per dozen; and no laundry is connected with the college. The college has dormitory accommodations for 30 students and cannot take all. Board can be obtained in private families at from $4 to $6 a week; room rent included.

The rooms in the dormitory are each furnished with bedstead and stove; students must furnish all else, including straw ticks or mattresses. The conditions of occupancy are: good conduct, a care and preservation of property, and a willing and cheerful obedience to the rules governing that part of the college.

TEXT BOOKS.

Books should not be purchased until the student arrives at the college, and after consultation with the members of the faculty, as changes are liable to take place, or the proper edition may not be obtained. Booksellers in Fort Collins furnish books to students of the College at a reduced rate, by special arrangement.

TOTAL EXPENSES.

As some persons are desirous of knowing just what it may cost to attend school for a year, the following summary of approximate cost is made:

Matriculation fee, - - - - -	$ 5 00
Incidentals, 3 terms, - - - -	3 00
Board, 36 weeks @ $3.35 per week. - -	120 60
Washing, (average) 50 cents per week, -	18 00
Books, (approximately), - - - -	15 00
	$161 60

In terms where the students labor on farm and garden, their wages go to lessen their expenses, so that an average of $150 will pay the yearly expenses of a student during the whole course. The Sophomore and Junior years are a little more expensive than the others, as fees must be paid for use of chemicals and apparatus.

CHEMICAL FEES:

Sophomore year, first term, - - - -	$ 5 00
Junior year, first and second terms, each, -	10 00

ADVANCE PAYMENT.

All fees must be paid in advance, and a receipt obtained from the secretary entitles the bearer to admission to the classes. Board must be paid monthly in advance, and no reduction is made unless for absence of a full week. In such case, one-half the time is allowed. An absence of two weeks entitles one to full reduction of time. A student leaving before the end of the term has any excess or balance to his credit refunded to him on settlement.

CONDITIONS OF ADMISSION.

The college is open alike to students of either sex. Candidates for admission must be fifteen years of age, and, unless personally known, must give good reference. They must also pass an examination in the common branches, viz.: Reading, Writing, Spelling, Grammar, Arithmetic and Geography. The work of the Preparatory year is, in part, a thorough and practical review of Grammar and Arithmetic, with the additional subjects of U. S. History, Physical Geography, Elementary Physiology, Elocution and Word Analysis; consequently, a candidate for admission to the Freshman class must pass an examination in these branches, and not receive conditions in more than two of them. In no case can one be conditioned on the study of Arithmetic. Candidates for advanced classes or work must be examined on all previous work or bring certificates of standing from schools having an equivalent grade of work.

REGULAR AND SPECIAL COURSES.

Unless there seem to be strong and excellent reasons for it, students will not be allowed to take a special course of study, and in case it is allowed, the student must show that he is well qualified to pursue the studies selected by passing such examinations as the faculty may assign. No student will be allowed to change his course during the progress of a term, nor will he be allowed to drop a study unless by permission of the faculty. A student cannot be allowed to leave college in term time without leave of absence, granted by the president or faculty; otherwise, the student will be liable to suspension or expulsion. Temporary leave of absence can be granted by the president or the officer in charge during his absence. Final separation from college must be acted upon by the faculty.

LABOR.

The labor of students at the college is required by law; each student must labor two hours each school day, unless excused for physical disability. The labor at the college is of two classes—first, that which is performed for purposes of teaching the student; and, second, that which is of some monetary value to the institution.

In the first class is placed all labor performed in chemical laboratory practice, in mechanic shop (work in wood or iron), and in field surveying and leveling, as well as some labor in greenhouse or conservatory. In the second class is included all labor upon the farm or garden, and extra time in mechanic shop, when the student has acquired a sufficient degree of skill. The rate paid for labor of the second class varies with the skill and fidelity of the student. The maximum price is ten cents per hour. It is believed that the students of the Agricultural College or of any industrial school are able to accomplish as much in the line of study as if no labor were performed. At the same time the labor helps to keep the physical nature strong and healthy, while the student, by learning well the principles underlying many trades and vocations, is made strong to grapple with the duties and responsibilities of life, while being educated to take his place among the best and most honored of our citizens of the future. The time that in many colleges is spent in revelry or athletic sports, of questionable utility, is thus devoted to that which is not only a present benefit, by helping to support the student while in college, but gives him a ready means of support in many ways as soon as he leaves college halls.

DISCIPLINE.

The discipline of the college is mild but firm, and the faculty reserve the right to suspend pupils with or without the knowledge of the parents according to the circumstances of the case. Good conduct is expected of all; and when it becomes manifest from the deportment of any student that his presence is detrimental to the best interests of the school, or when he fails to keep up a fair grade in his studies, such student will be removed.

DORMITORY REGULATIONS.

Young ladies are under the charge of a matron to whom all requests for privileges must be made.

Young men are expected to be at the dormitory at 7 P. M. each evening, except Sunday, when they have permission to attend church if they choose. Study hours begin at 7 P. M. and close at 10 P. M. The time for retiring is fixed at 10:15 P. M.

Any marked violation of the above regulations will be followed by warning and advice; if still persisted in, the student will be suspended from the dormitory if not from the college. Students boarding outside must obtain permission before visiting the dormitory. Damage to rooms or property about the dormitory will be assessed to the one occupying the room or to the whole body of dormitory students if the responsible parties are unknown.

RHETORICALS.

Each class in the college must have public rhetorical exercises at least once each term. These exercises for the three upper classes will consist of original productions, as orations and essays, at the discretion of the officer in charge. For the remaining two classes the exercises shall consist of declamations, recitations and essays, as assigned.

SOCIETIES.

The students have organized and maintained during the year, a good literary society. They adopted the name Philalethean and admitted students of both sexes. The exercises have been well sustained and have given excellent drill to those students who remained with it during the whole year.

At the close of the year the young ladies withdrew from the Philalethian society and formed a society of young ladies only. They adopted the name Aesthesian, elected their officers, and are prepared for active work next year.

MEANS FOR

INSTRUCTION AND ILLUSTRATION.

The college hall with chapel, drawing room, library and reading room, museum and office of president and secretary, besides five recitation rooms, armory, rooms for storage, etc.

The chemical labratory with lecture room for 35 students; also work or analytic room with desks for 20 students, each desk being supplied with water and gas for use of each student.

The conservatory, 20 x 50 feet, with curve roof and 1,500 feet of glass, containing about 280 species of plants representing many interesting and rare botanical families; also with potting room attached and heated by improved hot water apparatus manufactured by Hitchings & Co., of New York. The mechanic shop, consisting of main building 25 x 56 feet and two stories in height, with one story attachment for forge shop, etc., 20 x 62 feet. The whole fitted up with engine, wood and iron working machinery, benches with the proper tools for work by hand in wood and iron, including wood carving.

The farm of 240 acres with a large part under cultivation; some pure stock of different breeds.

The experimental ground carefully platted and containing in its area of eight acres 25 series of plats of 17 in each series; each plat containing two square rods.

The orchards and grounds carefully laid out and planted to ornamental shrubs and trees, the planting of forestry and the propagating ground of the same, the kitchen garden with its many varieties of vegetables and small fruits, hot beds and cold frames.

The apiary of Italian bees.

Thirty stand of arms in the armory for practice in military drill.

A full set of meteorological instruments by which tri-daily observations are taken and monthly reports sent to Washington, D. C.

The scientific department is supplied with a fine cabinet of specimens illustrating geology and mineralogy.

Skeletons to illustrate the various types of vertebrates in zoology and also comparative anatomy. These include skeletons of bird, fish, tortoise, salamander, serpent and frog, as well as the human skeleton for comparative study. Also, *papier mache* models showing thorax, section of lung,—lung removable,—heart, opening in sections showing position of valves and cavities. Model showing brain in section and spinal cord with pairs of branches.

The mathematical department is supplied with a good engineer's transit; a Wye level, (15 inch), rod, chains, etc., etc., for practical field work in surveying and engineering.

The college also has microscopes for work in various directions as well as for independent research.

LOCATION.

Fort Collins, the site of the college, is a fine town of about 2,500 inhabitants, and the county seat of Larimer county.

It is situated in the beautiful and fertile valley of the Cache-la-Poudre river, just after it emerges from the foothills which skirt the snowy range. The town is having a thriving and steady growth, and is well governed, and more orderly than most towns of its size. Extended views of the foothills and the ranges greet the eye, stretching away to the north and south, and culminating in Long's Peak, with its twin points, which seem like sentinels to guard this portion of the range. In other directions stretch away before you field on field of growing grain and gardens of fruits and vegetables. For healthfulness the location cannot be surpassed. There are fewer and less-disastrous storms and sudden changes than at any other point on the slope.

The college is situated at the south side of town, on gently rising ground, which overlooks the major part of the town. It is connected with the city system of water works, by which good, pure water is furnished for all purposes. The various buildings are scattered on either side of the Colorado Central Railroad track, and fronting on College Avenue, the finest residence avenue in the city.

The town is easily accessible from all parts of the state by means of the Colorado Central and the Greeley, Salt Lake and Pacific Railroads, by which two passenger trains arrive and depart, daily, for Denver and intermediate points. Persons from the north, as from Cheyenne and other points, can come by way of Greeley. Trains depart at 8.45 A. M. and 2.15 P. M., and arrive at 11.55 A. M. and 6.55 P. M.

HISTORY.

The State Agricultural College of Colorado, in common with those of her older sister states, had its origin in an Act of Congress, passed July 2, 1862, which granted ninety thousand acres of land as an endowment fund for a college "where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, * * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

To the State Board of Agriculture, organized soon after Colorado became a state, was entrusted the work of building a college, and caring for the same. The town of Fort Collins was selected as its site, and at a meeting, held February 27th, 1878, it was determined to erect a building suited to college purposes. The corner stone was laid July 29th, 1878, and in the same year the building was completed. The college was not opened for the reception of students until September 1st, 1879. The dormitory was erected in 1881, and the Chemical Laboratory in 1882, but not fitted thoroughly for work until May, 1883. A small propagating house was built in 1882, for the purpose of aiding Horticulture. The present green-house, nearly completed, with its curvilinear roof, and all modern appliances, is a long step in advance.

FACULTY.

The Faculty was organized July 1st, 1879, by the election of the following members: E. E. Edwards, Ph. D., President, and Professor Mental and Moral Science and English Literature; A. E. Blount, A. M., Professor of Agriculture and Farm Superintendent; F. J. Annis, Professor of Chemistry, Mathematics and Horticulture; Hon. H. Stratton, Secretary of Board and Faculty. At the close of the first year, Prof. Annis resigned, and Prof. Charles F. Davis was elected to succeed him. Secretary Stratton went out of office by limitation of term, and was succeeded by P. M. Hinman. In August, 1882, Pres. E. E. Edwards was succeeded by Prof. Charles L. Ingersoll, of Purdue University—a graduate of Michigan Agricultural College.

The Board and Faculty thoroughly reorganized the college, giving to its curriculum of study one full line of work throughout. At this time was added the department of Mechanics and Drawing, whereby each student is able to obtain two years of shop practice and the same time in practice in Drawing. The course in Science was extended and somewhat enlarged, in order to be more in keeping with an industrial college. The number of hours of labor was reduced to two in all departments. Prof. F. H. Williams was elected to fill the chair of Mechanics and Drawing, but on March 21st, 1883, he was succeeded by Prof. James W. Lawrence.

Changes followed rapidly. In February, 1883, Prof. James Cassidy was elected to the chair of Horticulture, and made Superintendent of the department, and at the same time the Floral department was merged into the Horticultural department.

In December, 1882, Prof. Elwood Mead was elected to the position of instructor in Mathematics, and in April, 1883, made full Professor in that department. At the same meeting of the Board, the chair of Veterinary Science was created, and the services of Dr. Geo. C. Faville, B. S., D. V. M., a graduate of Iowa Agricultural College, and also from its Veterinary department, has been secured for this chair. He is enjoying a lucrative practice, at present, at Danville, Kentucky. (June7, 1883).

The new year will see the college for the first time as a college, with full quota of classes, and with an adequate corps of teachers to carry the work.

FARM AND EXPERIMENTS.

From the organization of the college, experiments have been planned and carried on, but mostly with the cereals, grasses, etc. These experiments were carried on with painstaking care by Prof. A. E. Blount, and his exhibit of products raised on the college farm, and shown at the Denver Exposition in the fall of 1882, was justly the pride of the college and the state, and never has been excelled. The farm will be cultivated, to some extent, experimentally; but the Board decided to have a good experimental ground, and so set aside eight acres, which has been accurately platted, and this, with the farm, is now under the superintendence of the Professor of Agriculture.

HORTICULTURE.

The growth in this department has been steady and slow. The grounds are being seeded and ornamented as rapidly as means will permit. This year has witnessed the addition of forty-three varieties of grapes and several varieties of berries to our gardens, while many varieties of evergreens and deciduous trees have been propagated, and about 250 new species of plants have been added to the rapidly increasing collection in the conservatory.

LIBRARY AND READING ROOM.

The library has increased considerably during 1882–83, and now contains about 400 volumes, and numerous pamphlets and unbound matter. The first thirty-five volumes of the *Journal* of the Royal Agricultural Society of England were added in May, 1883. The reading room is well supplied with papers and magazines, the list comprising:—The *American Agriculturist*, *Country Gentleman*, *Rural New Yorker*, *Breeder's Live Stock Journal*, *Farmer's*

Home Journal, *The Century*, *Harper's Monthly*, *Princeton Review*, *North American Review*, *Popular Science Monthly*, *The Naturalist*, *Scientific American* and *Supplement*, *Gardener's Monthly*, *The American Miller*, Denver *Daily News*, Greeley *Tribune*, Longmont *Ledger*, Grand Junction *Democrat*, Loveland *Reporter*, Fort Collins *Weekly Express*, *Weekly Courier*, and others. During this year, the room has been open for the benefit of students an average of eight hours a day for five days, and two hours each on Saturday and Sunday.

FARMERS' INSTITUTES.

Series of farmers' institutes have been held each winter since the organization of the college. At these meetings, lectures are given by members of the faculty and others, these being followed by discussions interesting and often of vital importance to the farmers.

The growth of the college during the few short years of its existence has been rapid and solid. The state has nobly done her share by contributing funds necessary to carry on the work. The attendance has been all that could be expected, and, although there are no graduates to point to with pride as the product of the work performed, yet out of the many who have attended, we feel that some have been better fitted for the work of life; that the dignity of labor has been upheld, and that when the college shall have attained age enough to send out her first graduating class, she will compare well with those colleges which have counted more years in their growth and labors.

DAILY ROUTINE.

(Saturday and Sunday excepted.)

Rousing bell,	6 A.M.
Breakfast,	7 A.M.
Class recitations or labor,	7.45 to 9.45 A.M.
Chapel exercises,	9.45 to 10 A.M.
Classes and labor,	10 to 12 M.
Military drill,	12 to 12.30 P.M.
Dinner,	12.30 P.M.
Classes and labor,	1.30 to 4.30 P.M.
Supper,	6 P.M.
Study hours,	7 to 10 P.M.

CALENDAR.

1883-84.

SEPTEMBER.

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JUNE.

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CALENDAR.

COLORADO AGRICULTURAL COLLEGE.

1883.

Entrance examinations, - Tuesday, September 4
First or Fall Term commences, Wednesday, September 5
First Term closes, - - Tuesday, December 18

First or Winter vacation.

1884.

Second or Winter Term commences, Wednesday, January 2
Second Term closes, - - - Tuesday, March 18

Second vacation.

Third or Spring Term commences, Wednesday, March 26
Baccalaureate address, in College Chapel, Sunday, June 1
Closing examinations of the year, - June 2 and 3
Address before Societies, - - - - June 4
Commencement, - - - - - June 5

Summer vacation.

Examinations for admission to new year of 1884-5, Tuesday, September 2
First or Fall Term begins, Wednesday, September 3

REGISTER

OF THE

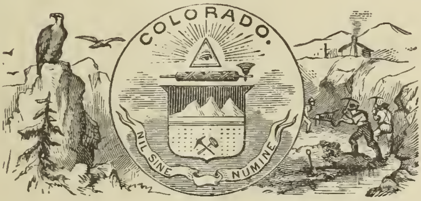
OFFICERS AND STUDENTS

AND

COURSES OF INSTRUCTION

IN THE

STATE AGRICULTURAL COLLEGE.



1883-84.

PRESS OF
Courier Publishing
Company,
Fort Collins, Colo.

MEMBERS OF
STATE BOARD OF AGRICULTURE.

	Term Expires.
Hon. B. S. LaGrange, Greeley,	February, 1891
Hon. W. F. Watrous, Fort Collins,	“ 1891
Hon. John J. Ryan, Loveland,	“ 1889
Hon. Henry Foote, Del Norte,	“ 1889
Hon. David Boyd, Greeley,	“ 1887
Hon. Ozro Bracket, Frankstown,	“ 1887
Hon. R. A. Southworth, Denver,	“ 1885
*Hon. G. W. Rust, Boulder,	“ 1885
His Excellency Gov. James B. Grant,	*Ex-officio.*
President Charles L. Ingersoll,	

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*Elected to fill vacancy caused by the decease of Hon. P. M. Hinman.

30830

OFFICERS OF STATE BOARD.

Hon. David Boyd, President. Hon. W. F. Watrous, Secretary.
Hon. Fred. Walsen, (*ex-officio*) Treasurer.

COMMITTEES.

FINANCES.

W. F. Watrous, O. Bracket, John J. Ryan.

FARM AND EXPERIMENTAL GROUND.

B. S. LaGrange, G. W. Rust, O. Bracket.

HORTICULTURE AND GROUNDS.

W. F. Watrous, R. A. Southworth, Henry Foote.

COLLEGE BUILDINGS.

B. S. LaGrange, Henry Foote, W. F. Watrous.

VETERINARY SCIENCE AND STOCK.

R. A. Southworth, O. Bracket, John J. Ryan.

MECHANICS AND CHEMISTRY.

G. W. Rust, Henry Foote, O. Bracket.

MATHEMATICS AND ENGINEERING.

John J. Ryan, B. S. LaGrange, R. A. Southworth.

FACULTY, TEXT-BOOKS AND COURSE OF STUDY.

Henry Foote, R. A. Southworth, G. W. Rust.

FACULTY OF INSTRUCTION.

CHARLES L. INGERSOLL, M. S.,
President, Professor of Political Economy and Logic.

AINSWORTH E. BLOUNT, A. M.,
Professor of Agriculture, Superintendent of Farm.

CHARLES F. DAVIS, M. S.,
Professor of Chemistry and Physics.

ELWOOD MEAD, B. S., C. E.,
Professor of Mathematics and Engineering.

JAMES CASSIDY,
Professor of Botany and Horticulture, Superintendent of Department.

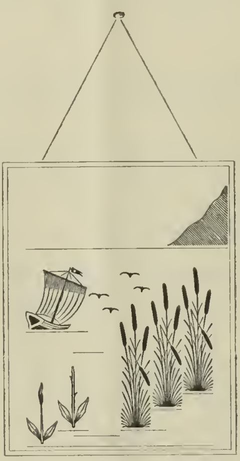
JAMES W. LAWRENCE,
Professor of Mechanics and Drawing.

GEORGE C. FAVILLE, B. S., D. V. M.,
Professor of Veterinary Science and Zoology.

MISS ELLA SILCOTT,
Instructor in Vocal and Instrumental Music.

MRS. C. L. INGERSOLL,
Matron of Ladies' Dormitory.

HON. W. F. WATROUS,
Secretary of State Board and Faculty.



REGISTER OF STUDENTS.

SENIOR CLASS.

Coy, Libbie,	Fort Collins,	Colo.
Glover, George H.,	Longmont,	"
Loomis, Leonidas,	Fort Collins,	"

JUNIOR CLASS.

Blinn, Cora B.,	Berthoud,	Colo.
Flinn, Anna E.,	Loveland,	"
Hice, Edna,	Fort Collins,	"
Loomis, Lelia,	"	"
Patton, Grace,	"	"
Trimble, Robert E.,	"	"
White, Helen,	"	"

SOPHOMORE CLASS.

Coy, William B.,	Fort Collins,	Colo.
Davis, Thomas L.,	"	"
Driscoll, William M.,	Aylmer,	Canada
Nettleton, Edwin G.,	Denver,	Colo.
Shay, Clark W.,	Loveland,	"
Sickman, Wilbert J.,	Fort Collins,	"
Stewart, Ulysses S.,	Rustic,	"

Budd, Harry S.,	Fort Collins,	Colo.
Coffin, Gertrude E.,	"	"

FRESHMAN CLASS.

Aldrich, Mary S.,	Livermore,	Colo.
Baldwin, William E.,	Denver,	“
Blount, Nettie M.,	Fort Collins,	“
Carpenter, Harry A.,	“	“
Foster, Agnes E.,	“	“
Gill, Eleanor F.,	“	“
Mandeville, Grace P.,	“	“
McKissick, Nettie E.,	Loveland,	“
McKissick, Oliver,	“	“
Peterman, Dora E.,	Fort Collins,	“
Ryan, Charles,	Loveland,	“
Shay, Luella,	“	“
Stratton, Daisy E.,	“	“
Stratton, Lera G.,	“	“
Virden, Marietta,	Grand Junction,	“
Vollintine, Mabel,	Fort Collins,	“
Wetzler, Charles L.,	Livermore,	“

PREPARATORY CLASS.

Amburgh, Sam.,	Denver,	Colo.
Black, David A.,	Fort Collins,	“
Budrow, Frank,	“	“
Burnett, Cora L.,	Loveland,	“
Cline, Parker E.,	Denver,	“
Coffin, Lewis,	Longmont,	“
Coffin, Mark,	“	“
Fisk, James R.,	Livermore,	“
Gammon, Ernest A.,	Richland,	Cal.
Garbutt, Newton C.,	La Porte,	Colo.
Lee, Josephine,	Mt. Ayr,	Iowa
Lyon, Agnes E.,	Fort Collins,	Colo.
McLain, Genevieve E.,	“	“

Olney, Willis E., - - -	Platteville,	Colo.
Overholt, Edwin S., - -	Denver,	"
Overholt, George E., - -	"	"
Pound, Albert L., - -	Highland Lake,	"
Reavill, Emma, - - -	Fort Collins,	"
Secord, Courtland, - -	"	"
Southworth, L. Maude, - -	Denver,	"
Strickler, W. Harry, - -	"	"
Taylor, Luella, - - -	Longmont,	"
Van Brunt, Charles W., -	Fort Collins,	"
Wallace, John U., - - -	La Porte,	"
Wetzler, Fred., - -	Fort Collins,	"

SPECIAL STUDENTS.

Burns, Alana L., - - -	Fort Collins,	Colo.
Bowlin, Eurilla H., - -	"	"
Clark, Anna O., - - -	"	"
Elstun, Della, - - -	"	"
Evans, Robert C., - - -	Denver,	"
Fuller, M. W., - - -	Fort Collins,	"
Inglefield, Maud, - - -	"	"
Long, Mary V., - - -	Middletown,	Mo.
Maxwell, Lulu, - - -	Chugwater,	Wyo. Ter.
McKinley, Thomas W., -	Fort Collins,	Colo.
McKissick, Alice M., - -	Loveland,	"
Post, Lillian E., - -	Fort Collins,	"
Reed, Maggie, - - -	Knox City,	Mo.
Silcott, Ida, - - -	Fort Collins,	Colo.
Silcott, Lillie M., - - -	"	"
Washburn, Albina L., - -	Loveland,	"

RECAPITULATION.

Seniors,	3
Juniors,	7
Sophomores,	9
Freshmen,	17
Preparatory,	25
Special Students,	16
Total students enrolled,	77

Gentlemen,	37
Ladies,	40
Total,	77

COURSE OF STUDY AND LABOR.

PREPARATORY YEAR.

FIRST TERM.

Arithmetic,	Thompson
Elocution,	Fenno
Elementary Physiology,	Hutchinson
English Analysis,	Kellogg

Labor, two hours, farm and garden.

SECOND TERM.

Arithmetic, six weeks,	Thompson
Elementary Algebra, six weeks,	Olney
U. S. History,	Ridpath
Physical Geography,	Houston
English Analysis,	Kellogg

Labor, two hours, shop practice.

THIRD TERM.

Elementary Algebra,	Olney
U. S. History,	Ridpath
Penmanship,	Spencerian
Word Analysis,	Swinton

Labor, two hours, farm and garden.

FRESHMAN YEAR.

FIRST TERM.

Geometry,	Wentworth
Elementary Rhetoric,	Kellogg
Drawing,	Lectures and practice
Agriculture,	Lectures

Labor, two hours, shop practice.

SECOND TERM.

Geometry,	Wentworth
Book Keeping,	Lectures and practice
Drawing,	Lectures and practice
Botany,	Lectures and Gray

Labor, two hours, shop practice.

THIRD TERM.

Algebra,	Olney
Drawing,	Lectures and practice
History (Ancient),	Thalheimer, Vol. I.
Botany,	Field work, Gray

Labor, two hours, farm and garden.

SOPHOMORE YEAR.

FIRST TERM.

Algebra, - - - - - - - Olney
History, - - - - - Thalheimer, Vol. II.
Drawing, - - - - Lectures and practice
Elementary Chemistry, - - - - Lectures
Labor, two hours, laboratory practice.

SECOND TERM.

Trigonometry, - - - - - Wentworth
English Literature, - - - - - - Shaw
Drawing, - - - - Lectures and practice
Organic Chemistry, six weeks, - - - Lectures
Zoology, six weeks, - Laboratory work, Packard
Labor, two hours, shop practice.

THIRD TERM.

Surveying, - - - - - - Gillespie
English Literature, - - - Readings, Shaw
Drawing, - - - - Lectures and practice
Zoology, - - - Laboratory work, Packard
Labor, two hours, field surveys, leveling and platting.

JUNIOR YEAR.

FIRST TERM.

Physics, - - - - - Snell's Olmstead
Rhetoric, - - - - - - - - Bain
Geology, - - - - - - - Le Conte
Agricultural Chemistry, - - - - Lectures

Labor, two hours, chemical analysis.

SECOND TERM.

Physics, - - - - - Snell's Olmstead
Floriculture and Gardening, - - - Lectures
Anatomy and Physiology, - - Lectures, Martin
Agriculture, - - - - - - Lectures

Labor, two hours, chemical analysis.

THIRD TERM.

Microscopy, - - - - Lectures and practice
Horticulture, - - - - - - Lectures
Physiology, - - - - - - - Martin
Entomology, - - - - - - Lectures

Labor, two hours, conservatory, etc.

SENIOR YEAR.

FIRST TERM.

Chemical Physics, - - - - - - Miller
Landscape Gardening, - - Kemp and lectures
Veterinary Science, - - - - Lectures
Or French, - - - Otto's Bocher, Grammar
Psychology, - - - - - - Porter
Or Hydraulic Engineering, - - - Lectures
Labor, two hours, shop practice; or,
Clinic, Friday, for students in Veterinary Science.

SECOND TERM.

Meteorology, - - - - - - Lectures
Moral Science, - - - - - Fairchild
Veterinary Science, - - - - - Lectures
Or French, - - - - Grammar and Reader
Logic, - - - - - - - Fowler
Labor, two hours, shop practice; or,
Clinic, Friday, for students in Veterinary Science.

THIRD TERM.

Astronomy, - - - - - - Loomis
Or Hydraulic Engineering, - - - Lectures
Veterinary Science, - - - - Lectures
Or French, - - - Grammar and Reader
U. S. Constitution, - - - - - Lectures
Political Economy, - - - - - Lectures
Labor, two hours, shop practice; or,
Clinic, Friday, for students of Veterinary Science.

COURSE OF INSTRUCTION AND LABOR.

PREPARATORY YEAR.

1st Term.	Arithmetic. } 20 weeks.	Elocution.	El. Physiology.	English Analysis.	Labor on farm, 2 hours.
2d “	“ El. Algebra. } 20 weeks.	U. S. History.	Phys. Geography.	“ “	Shop practice, “
3d “	“	“ “	Penmanship.	Word “	Labor on garden, “

FRESHMAN YEAR.

1st Term.	Geometry.	El. Rhetoric.	Drawing.	Agriculture Lectures.	Shop practice, 2 hours.
2d “	Geometry, completed.	Book Keeping.	“	Botany.	“ “ “
3d “	Algebra.	History (Ancient).	“	“	Labor on farm, “

SOPHOMORE YEAR.

1st Term.	Algebra, completed.	History (Con.).	Drawing.	El. Chemistry.	Laboratory practice, 2 hrs.
2d “	Trigonometry.	English Literature.	“	Organic Chemistry. Zoology.	Shop practice, “
3d “	Surveying.	“ “	“	Zoology.	Field surveys and levels.

JUNIOR YEAR.

1st Term.	Physics.	Rhetoric.	Geology.	Agricult'l Chemistry.	Chemical analysis, 2 hrs, Lab. work.
2d “	“	Floriculture.	Anatomy, 6 weeks. Physiology, 5 weeks.	Agriculture Lectures.	
3d “	Microscopy.	Horticulture.	Physiology.	Entomology.	Labor on garden, 2 hours, or Microscopy.

SENIOR YEAR.

1st Term.	Chemical Physics.	Landscape Gardening.	Veterinary Science.	*Psychology.	Mechanics, 2 hours shop practice.
2d “	Meteorology.	Moral Science.	“ “	Logic.	
3d “	*Astronomy.	U. S. Constitution.	“ “	Political Economy.	Clinics, Friday.

*Elective with Irrigation Engineering.

DEPARTMENTS OF INSTRUCTION AND LABOR.

AGRICULTURE.

THE study is pursued by a course of lectures in the first term of the freshman year, in which are discussed the various breeds of horses, cattle, sheep, swine and poultry; their peculiarities, history, adaptation, etc., etc.; also, herd books, their growth and history; pedigrees, their variation in form in different herd books, means of tracing and detecting errors in record. Families in different breeds are discussed, and the origin of families and family names fully explained.

In the junior year, the student is given more instruction in this line after he has pursued thoroughly those branches of science which underlie or are closely related to agriculture. Lectures are given in stock-breeding, erection of farm buildings and farm economy, including a thorough discussion of the principles governing the rotation of crops. Other topics will be discussed which are of vital importance to the agriculturist.

Students labor upon the farm and at the experimental ground two hours daily on each school day. "Labor and study, theory and practice go hand in hand. To know how and when to do work well is a science; to acquire the skill is an art. That they may obtain the science, study is necessary; to get the art, work is indispensable."

BOTANY.

The instruction in botany is very full and complete, commencing with the study of vegetable physiology and proceeding to structural and systematic botany. After a thorough study of principles, the students are required to study the plants, and in this way to fix in their minds the principles before so thoroughly scanned. Two terms of the freshman year are devoted to the foregoing work. The new greenhouse, completed September 1st, 1883, furnishes ample material for work, and, distributed over a large number of botanical families, our facilities for instruction in this branch are unsurpassed. In the last term of the junior year, the students take up the work of microscopy, in which the study of histology is pursued. Many plants and organs are examined by section, and the student required to make drawings and permanent mountings of the same. In this manner, the students become prepared to go on and make independent investigations in various directions, in after life.

CHEMISTRY.

It is the object of this department to give the student an opportunity to acquire a thorough mastery of the elementary principles of the chemical science. To attain this object, the theory and practice are made to go hand in hand. In the first term of the sophomore year, the class listens to a series of lectures upon the general theory of the science, its history and development. In this course of lectures are discussed the subjects of acids, bases and salts, and the principles of the chemical philosophy. The nature, history and compounds of each of the elements are discussed in detail, the whole being enforced by numerous experiments. While taking this course, the student spends two hours each day in the work-room, repeating the experiments shown in class, and others which may be suggested, and prepares a series of substances by the synthetic process. This labor serves to familiarize the student with various forms of crystals, the marked distinction between various classes of salts, the use of the nomenclatures, and the manipulation of apparatus.

In the second term of the sophomore year, there is given a course of lectures on Organic Chemistry, continuing for six weeks, one hour daily.

In the first term of the junior year, the student listens to a course of lectures upon Agricultural Chemistry, in which are discussed such subjects as the following: Relation of chemistry to agriculture, the literature of Agricultural Chemistry; elements of plant growth, their relative abundance and importance; the atmosphere, the soil, fertilizers, etc.

During these terms the class spend two hours daily in the work-room, where they pursue the study of qualitative analysis, by precipitation, and a short practice in volumetric analysis. Practice in the use of the blowpipe accompanies this work, and an insight into determinative mineralogy is thus acquired. The student will also make a few determinations quantitatively of the relative ash of plants; the water and organic matter of plants, and at least one ultimate analysis of soil.

Keeping in mind the objects for which our college is founded, we have so planned our chemical course as to prepare the student for the general application of chemistry in its relation to the industrial arts, while seeking especially to thoroughly ground him in the application of the science to agriculture.

PHYSICS.

The study of Mechanical and Chemical Physics will continue for three terms. The first term will be devoted to the study from text-book of the mechanics of solids. The second term will be given to the subjects of Hydrostatics, Pneumatics, Acoustics and Optics, by lecture. In the last term will be given the subjects of Heat, Electricity and Magnetism, from the standpoint of Chemical Physics. The whole study of Physics will be illustrated, where practicable, by apparatus and experiment.

METEOROLOGY.

In the second term of the senior year the student listens to a course of lectures upon Meteorology, in which he hears discussed the nature of the atmosphere and atmospheric phenomena; the general circulation of the air, variable winds, cyclones, tornadoes and hurricanes; laws of storms and circulation of oceanic waters; the work of the U. S. Signal Service Bureau, and the manner of taking observations, with a discussion of the principles involved.

HORTICULTURE.

Instruction in the several branches of Horticulture is given as follows: In practical Floriculture, by lectures upon such topics as the construction, heating and management of greenhouses; the propagation of plants by seeds, cuttings, layers, budding and grafting; how budding and grafting is done, and its uses; the cultivation and general management of greenhouse plants for commercial or private purposes; insects and diseases of plants under glass, with remedies therefor; parlor gardening, Wardian cases, and ferneries; arrangement of flowers in bouquets and floral designs.

Instruction in Pomology is given by lectures, and embraces a theoretical and practical study of the propagation, planting, pruning and general management of orchards and small fruit gardens; insect enemies, diseases, and varieties best adapted to this latitude; classification of fruits by form, habit of growth, flowers and leaves.

Vegetable Culture comprises kitchen and market gardening, and seed growing; and the principal topics considered are: The best situation for, and the laying out of the garden with a view to its irrigation, and most economical management in the rotation and planting of crops for the family and for market; management of composts and commercial fertilizers; care of tools; selection and growing of seeds; construction, management and uses of hot-beds and cold frames; harvesting, marketing and storing of fruits and vegetables.

Forestry is taught by lecture, special attention being given to such topics as the value of trees and shrubs for timber and ornament, for hedges, screens, and shelter belts for this state; the best methods of culture, with a history of varieties, especially such as are thought worthy of trial in this latitude.

Landscape Gardening is taught in the senior year by regular study of text-book: Kemp's "How to Lay Out a Garden," and lectures, adapted as much as possible to the exigencies of this climate; frequent use being made of the grounds, and their planting, for illustration. The orchards, nursery, greenhouse, vegetable garden and flower garden afford ample opportunity to the student to acquire a practical acquaintance with the above topics. Each student before completing the study must complete a formal plat, arranged with reference to the best principles of the art.

MATHEMATICS.

The instruction offered by this department is designed to conform to the general aim and purpose of the institution; accordingly, only those branches of pure mathematics are taught, which the student will find of greatest service in after life. The instruction in this portion of the subject being about the same as that of classical colleges, while the attention given to applied mathematics, including surveying and engineering, is much greater than that of the usual college course.

Arithmetic.—Students entering the preparatory year in the first and second terms pay special attention to decimal notation and general analysis, covering the several departments of commercial arithmetic.

Algebra.—The study of Algebra occupies the last sixteen weeks of the preparatory year, the third term of the freshman, and the first term of the sophomore years. In the first term the principal object is to thoroughly familiarize the pupil with the use of literal quantities and the processes of factoring. The second term's work is largely devoted to the study of the equation, and its uses in the solution of intricate problems in interest, common discount and alligation, and for the demonstration of geometrical and trigonometrical theorems. The last term is given to Higher Algebra. Through this study two objects are kept prominently in view: First, to give the pupil facility in the use of algebraic processes, and second, to train him to methods of reasoning rather than operating.

Geometry is placed in the first and second terms of the freshman year—Plane Geometry occupying the first term and Solid Geometry about nine weeks of the second. Problems in mensuration and original exercises will be added to the routine text-book work, giving the student frequent practice in the application of principles already acquired, and enabling him to fix more firmly the knowledge gained.

TRIGONOMETRY AND SURVEYING.—Trigonometry is taught during the second term of the sophomore year. This is followed in the third term by surveying; the instruction in which will be in part by lectures, and includes theory, adjustment and use of instruments, history and methods of the U. S. Government surveys. In addition to the class-room exercises, the students will be required to devote from two to three hours daily to practice in the field. They will take their own notes, from which they will be required to submit computations, accompanied by drawings made to scale.

IRRIGATION ENGINEERING.—To such students as elect to take the studies, two terms of the senior year will be given to Irrigation Engineering. One term to be devoted to the pressure and flow of water, and methods of determining the same; and one to the survey and construction of canals and reservoirs. This course is elective with Psychology and Astronomy.

ASTRONOMY.—Senior students pursue the study of Astronomy during the third term of that year. It will be chiefly descriptive.

PRACTICAL MECHANICS.

The old system of apprenticeship is rapidly becoming a thing of the past, and it is now almost impossible for a boy to learn a trade in any modern shop or factory. This is owing, largely, to the introduction of special machinery, necessitating special workmen to manage it, and the workman who has learned to run a machine of this kind is kept at that work, as being most profitable to his employer; his practical knowledge of other methods and machines is, therefore, confined to narrow limits, and, should a vacancy occur in a superior position, he is not the man for the place, from the fact of his being unacquainted with other practical parts connected with his trade, the manipulations and principles involved in which he has not had an opportunity to learn.

This department has for its object a systematic and progressive education in the use of tools and materials, combined with as much theoretical knowledge as shall be deemed necessary to properly explain the principles involved. It does not teach special trades, nor manufacture salable articles; to do so would require that the student be kept on the kind of work he could do best, and thus prevent him from acquiring broad and liberal ideas of other methods. So without teaching any one complete trade, the mechanical principles of many are gained. This does not necessarily mean that the student becomes sufficiently expert to compete with the skilled mechanic, but that a knowledge of *how* a tool or machine should be used, and the manner of *laying out work* for the same, is thoroughly taught.

Although it is not expected that all students are to become mechanics, yet such a training cannot but make its salutary effects felt in whatever walk of life he may choose.

Should his surroundings be such that he enters manufacturing, his ideas having been broadened by this training, he will the more readily grasp anything new that may come up in his business, or, if he takes up farming, he will, with greater ease, be able to understand the mechanical principles and workings of his machinery, and also how to keep them and his buildings in proper repair.

The shop instruction will be divided in courses as follows, and in each course will be given, in connection with the work, an explanation of the construction of each tool, its manner of acting on the material, and methods of determining how to select materials best suited to different kinds of work, and manner of laying out work, cutting speed of tools, etc.

COURSE OF LABOR.

Bench work in wood, - -	12 weeks	1st year.
Machine work in wood, - -	4 weeks	
Pattern making and foundry work,	12 weeks	
Vise work in iron, - - -	10 weeks	
Iron forging, - - - -	14 weeks	2d year.
Steel forging, - - - -	4 weeks	
Machine work in iron, - -	20 weeks	

BENCH WORK IN WOOD.—This course will consist of exercises with the different wood working bench tools, so arranged in a graded series as to embrace the manipulation of the tools in their various applications.

First—The use of the planes in jointing, smoothing and getting the piece out of wind, lining off, and the use of the saws in cutting across and with the grain and keeping to line.

Second—Halved splice.
Third—Splayed splice.
Fourth—Keyed splice.
Fifth—Open dovetail mortise and tenon joint.
Sixth—Mortise and tenon joint.
Seventh—Open dovetail joint.
Eighth—Blind dovetail joint.
Ninth—Lap joint.
Tenth—Dowel joint.
Eleventh—Small newel-post with hand-worked rail.
Twelfth—Panel door.
Thirteenth—Roof truss.
Fourteenth—Box.
Fifteenth—Carpenter's trestle.

MACHINE WORK IN WOOD.—In connection with this course, with the use of tools, will be given the most rapid and economical method of selecting and preparing the wood for the machine. There will be given examples of

First—Straight turning.

Second—Cutting-in and squaring-off.

Third—Convex, concave and compound curves.

Fourth—Handles for chisels and other tools.

Fifth—Examples in chuck-work in separate and combined pieces.

Sixth—How to turn a ball.

Some of these pieces will be used in connection with ornamental scroll-sawing.

PATTERN MAKING AND FOUNDRY WORK.—After becoming familiar with bench and machine work in wood, an application of both is made, by constructing patterns with due regard to shrinkage, draft and the best method of constructing the pattern, so that it cause the least amount of trouble in the foundry. There will be given examples of

Plain work.

Core work.

Pulley work.

Pipe work.

Gear work.

Core boxes, their uses and construction.

And in the foundry will be given practice in moulding in plain and core and management of the furnace and core-oven.

VISE WORK IN IRON.—With this course will be given an explanation of the different kinds of tools and their effect on the material, and the style of tool to be selected for certain kinds of work. There will be given examples in

Chipping cast iron, wrought iron and steel.

Spline chipping.

Hack sawing.

Filing square and round surfaces to line.

Shoulder, point and other free-hand filing.

Fitting joints.

Finishing and scraping.

FORGING IN IRON AND STEEL.—Care of the fire.

The effect of different heats on the material.

Drawing, upsetting, bending.

Scarf, fork, jump and other styles of welding.

Welding iron to iron, iron to steel, steel to steel.

Rings, chains, ring-bolts, brackets, braces, heading-tools, nails, bolts, hooks, hasps, swivels, tongs.

Steel wrenches, cold chisels, drills, lathe tools, springs, etc.

Examples in tempering and case-hardening.

MACHINE WORK IN IRON.—Care of the machines, their construction, proportion and use of the different parts.

Cutting speed of tools, and proper angle of cutting edge for different purposes and different metals.

Centering and straightening work.

Straight turning and squaring.

Boring.

Making and fitting joints.

Chuck-work.

Screw-cutting inside and outside.

Drilling, tapping and reaming.

Boring with boring-bar and use of center rest.

Polishing and finishing.

Hand-tool work.

DRAWING.

FIRST YEAR.

Geometrical problems.
Free-hand copy and dictation.
Designs.
Linear perspective.
Model and object drawing.

SECOND YEAR.

Orthographic and Isometric projections, and projection of shadows.

Development and intersection of surface.
Light and shade.
Historical ornament.
Wood carving, diaper, incised and relief.
Ornamentation of pottery, tiles, etc.

VETERINARY SCIENCE.

The department of Veterinary Science was introduced September 1, 1884. The course of study runs through the whole of the senior year. During the first term, the class is given lectures upon the anatomy and physiology of the domestic animals, taking the horse as the type, and illustrating the lectures by means of anatomical models and actual dissections by the class. During the second term the course consists of lectures upon diseases and treatment and materia medica; the lectures being supplemented by the diagnosis of cases at the clinic, and actual practice in prescribing and compounding medicines for the cases presented. During the third term of the year the lectures upon diseases and treatment are concluded, and the class are given lectures upon veterinary sanitary science (the relation that diseased animals bear to the public health), and the management and care of breeding animals.

During the entire year there are held weekly clinics, where animals are treated free of charge, except for medicines and care. During the first two terms of the year just passed, about one hundred and twenty-five cases, illustrating the diagnosis, care and treatment of many of the acute and chronic surgical and constitutional diseases, were examined and treated before the class. Of these, seventy-five were surgical cases, and the remainder were cases illustrating the various kinds of lameness and acute and chronic diseases. From the increased interest manifested by the people, undoubtedly many more cases will be presented for illustrative treatment next year.

PHYSIOLOGY AND COMPARATIVE ANATOMY.

The study of the Elements of Physiology is commenced in the second term of the preparatory year, and continued sixteen weeks. The more thorough study is begun in the second term of the junior year, lectures being given on Anatomy, and followed by a thorough study ot Physiology. Martin's "Human Body" is used as text-book, supplemented by lectures.

ZOOLOGY.

This branch of study is begun in the middle of the sophomore year and runs through sixteen weeks. The text-book used is "Packard's Zoology," briefer course, supplemented by lectures and museum work. The museum work consists of dissections and drawings and classification of animals. The college facilities in the way of skeletons and specimens of both marine and inland fauna are not equaled in the west, and additions are being constantly made.

ENTOMOLOGY.—This branch of Zoology is studied more completely in a course of lectures in the junior year, in which the subject of bee-keeping receives especial attention. The instruction deals largely, after the grouping and classification are disposed of, with the study of those species and genera of insects which are either beneficial or injurious to the agriculturist. In this connection are discussed the various known means and remedies of checking the ravages of those injurious. Some laboratory work will be required of each student.

MICROSCOPY.

In the last term of the junior year the students take up the work of Microscopy. In this work the student takes up the particular study of histology, completing the work begun in Botany by a study of many of the fungii, and accompanying the study of Physiology and Anatomy by the microscopical study of the structure of organs. The laboratory is fitted with Beck's Economic microscopes, furnished with two eyepieces and one-half and one-sixth objectives, giving a magnifying power of from 60 to 800 diameters, and all the necessary apparatus for the best of scientific work. These instruments were imported from the well-known firm of R. & J. Beck, London, which is a sufficient guarantee of their quality. The object of this work is to fit the student to make independent investigations in various directions, and each student is required to work out carefully some particular topic in Biology, with careful notes, drawings, and mounted specimens, which will be kept as the property of the institution.

ENGLISH.

The study of this branch is begun as a review of English Analysis, carried over two terms. This is followed by one term of Word Analysis, thus making one continuous line of study during the whole preparatory year.

RHETORIC.

Elementary Rhetoric is studied during the first term of the freshman year. Students are required to write and submit essays weekly, during the course. In the junior year the study is continued through the fall term, when more advanced features of the study and discussions on the same take place.

HISTORY AND LITERATURE.

Ancient History is commenced in the last term of the freshman year. Text-book and essays on special topics constitute the course. The study of mediæval and modern History is continued in the first term of the next year. The aim of this course is to impress on the mind the importance of the study and its bearing on the study of the

LITERATURE.—English Literature is studied from text-book and by critical readings of selections from leading authors of the various epochs or periods. This study is pursued two terms.

MENTAL AND MORAL SCIENCE.

These studies are pursued in the senior year, in such a manner as to give a good outline in each, which the student is expected to fill in largely by supplementary readings.

LOGIC.

The study of this branch is considered of prime importance, as in the presentation of the inductive we find the methods pursued for the advancement of science and the means of elimination of error from experiment. The term's work is equally divided between the inductive and the deductive method.

POLITICAL ECONOMY.

Wayland, lectures and discussions, are used. The short term only gives sufficient time to arouse an interest in the divisions of the subject, and leads the student to read and act intelligently on the questions which interest us as a nation in our growth and increase of wealth.

The study of the Constitution of the United States and of the State of Colorado all conjoin to make more broad the mind of the student and the better fit him to take his place among the citizens of this or other states.

DEGREE.

Upon those who complete the work of the course as laid down, in a good and satisfactory manner, the State Board of Agriculture, upon recommendation of the faculty of instruction, confer the degree of Bachelor of Science. A finely-engraved diploma is the form of the testimonial used, the fee for which and graduation is fixed at ten dollars, without other public expense to the student.

EXPENSES.

Matriculation (entrance fee, entitling the student to the privileges of the whole course),	$ 5 00
Incidental fee, per term,	1 00
Board in dormitory (including room rent, heat and light), per week [about cost],	3 35
Graduation fee,	10 00

Tuition, free.

Washing averages about 75 cents per dozen; and no laundry is connected with the college. The college has dormitory accommodations for thirty students, and cannot take all. Board can be obtained in private families at $4 a week, room rent included.

The rooms in the dormitory are each furnished with bedstead and stove; students must furnish all else, including straw ticks or mattresses. The conditions of occupancy are: Good conduct, a care and preservation of property, and a willing and cheerful obedience to the rules governing that part of the college.

TEXT BOOKS.

Books should not be purchased until the student arrives at the college, and after consultation with the members of the faculty, as changes are liable to take place, or the proper edition may not be obtained. Booksellers in the city furnish books to students of the college at a reduced rate, by special arrangement.

MUSIC.

For the accommodation of those students wishing to take vocal or instrumental Music, this department has been added. Instruction in this branch is not free, the instructor having no other remuneration except the fees paid by the students.

Instruction on piano or organ, per hour,	$ 50
Vocal instruction, twenty lessons, in class,	1 00

Voice culture, extra.

TOTAL EXPENSES.

As some persons are desirous of knowing just what it may cost to attend school for a year, the following summary of approximate cost is made:

Matriculation fee (paid once),	$ 5 00
Incidentals, 3 terms,	3 00
Board, 36 weeks at $3.35 per week,	120 60
Washing, (average) 50 cents per week,	18 00
Books (approximately),	15 00
	$161 60

In terms where the students labor on farm and garden, their wages go to lessen their expenses, so that an average of $150 will pay the yearly expenses of a student during the whole course. The sophomore and junior years are a little more expensive than the others, as fees must be paid for use of chemicals and apparatus.

CHEMICAL FEES:

Sophomore year, first term, - - - -	$ 5 00
Junior year, first and second terms, - - -	15 00
Total for chemical course, - - -	$20 00

SHOP FEE:

A small fee will be required to cover cost of stock consumed and damages to tools; this is payable in advance.

ADVANCE PAYMENT.

All fees must be paid in advance, and a receipt obtained from the secretary entitles the bearer to admission to the classes. Board must be paid monthly in advance, and no reduction is made unless for absence of a full week at one time. In such case, one-half the time is allowed. An absence of two consecutive weeks entitles one to full reduction of time. A student, leaving before the end of the term, has any excess or balance to his credit refunded to him on settlement.

CONDITIONS OF ADMISSION.

The college is open alike to students of either sex. Candidates for admission must be fifteen years of age, and, unless personally known, must give good reference. They must also pass an examination in the common branches, viz.: Reading, Writing, Spelling, Grammar, Arithmetic and Geography. The work of the preparatory year is, in part, a thorough and practical review of Grammar and Arithmetic, with the additional subjects of U. S. History, Physical Geography, Elementary Physiology, Elocution, Word Analysis and Penmanship; consequently, a candidate for admission to the freshman class must pass an examination in these branches, and not receive conditions in more than two of them. In no case can one be conditioned on the study of Arithmetic. Candidates for advanced classes or work must be examined on all previous work, or bring certificates of standing from schools having an equivalent grade of work.

REGULAR AND SPECIAL COURSES.

Unless there seem to be strong and excellent reasons for it, students will not be allowed to take a special course of study, and in case it is allowed, the student must show that he is well qualified to pursue the studies selected by passing such examinations as the faculty may assign. No student will be allowed to change his course during the progress of a term, nor will he be allowed to drop a study unless by permission of the faculty. A student cannot be allowed to leave college in term time without leave of absence, granted by the president or faculty; otherwise, the student will be liable to suspension or expulsion. Temporary leave of absence can be granted by the president, or the officer in charge during his absence. Final separation from college must be acted upon by the faculty.

LABOR.

The labor of students at the college is required by law; each student must labor two hours each school day, unless excused for physical disability. The labor at the college is of two classes: First, that which is performed for purpose of teaching the student; and, second, that which is of some monetary value to the institution.

In the first class is placed all labor performed in chemical laboratory practice, in mechanic shop (work in wood or iron), and in field surveying and leveling, as well as some labor in greenhouse or conservatory. In the second class is included all labor upon the farm or garden, and extra time in mechanic shop, when the student has acquired a sufficient degree of skill. The rate paid for labor of the second class varies with the skill and fidelity of the student. The maximum price is ten cents per hour. It is believed that the students of the Agricultural College or of any industrial school are able to accomplish as much in the line of study as if no labor were performed. At the same time, the labor helps to keep the physical nature strong and healthy, while the student, by learning well the principles underlying many trades and vocations, is made strong to grapple with the duties and responsibilities of life, while being educated to take his place among the best and most honored of our citizens of the future. The time that in many colleges is spent in revelry or athletic sports, of questionable utility, is thus devoted to that which is not only a present benefit, by helping to support the student while in college, but gives him a ready means of support in many ways as soon as he leaves college halls.

MILITARY DRILL.

Military drill is required of all male students, unless excused for physical disability or by special vote of faculty, for special satisfactory reason. An exception is made in the last term of the senior year. It is believed that the drill has a very salutary influence in favor of good order and discipline, besides being a healthful and invigorating exercise. The short time devoted to it (twenty minutes daily, when the weather allows,) gives it more the character of a recreation than an irksome task.

DISCIPLINE.

The discipline of the college is mild, but firm, and the faculty reserve the right to suspend pupils with or without the knowledge of the parents, according to the circumstances of the case. Good conduct is expected of all; and when it becomes manifest from the deportment of any student that his presence is detrimental to the best interests of the school, or when he fails to keep up a fair grade in his studies, such student will be removed.

DORMITORY REGULATIONS.

Young ladies are under the charge of a matron, to whom all requests for privileges must be made.

Young men are expected to be at the dormitory at 7 P. M. each evening, except Sunday, when they have permission to attend church if they choose. Study hours begin at 7 P. M. and close at 10 P. M. The time for retiring is fixed at 10:15 P. M.

Any marked violation of the above regulations will be followed by warning and advice; if still persisted in, the student will be suspended from the dormitory, if not from the college. Students boarding outside must obtain permission before visiting the dormitory. Damage to rooms or property about the dormitory will be assessed to the one occupying the room, or to the whole body of dormitory students if the responsible parties are unknown.

COLLEGE REGULATIONS.

Each student is expected to maintain a grade of 70, on a scale with 100 as perfect. Any student who fails to maintain this grade will be reported to the faculty by the professor in charge of such study or labor. It is then the duty of the president to announce such failure publicly before the school, after which such student shall have two weeks in which to raise his grade; at the end of this time, if such student fail to raise his grade, he shall be suspended from the school, unless sickness of the student or his friends interfere with his work, or there be some other equally extenuating circumstance, when the rule shall be inoperative.

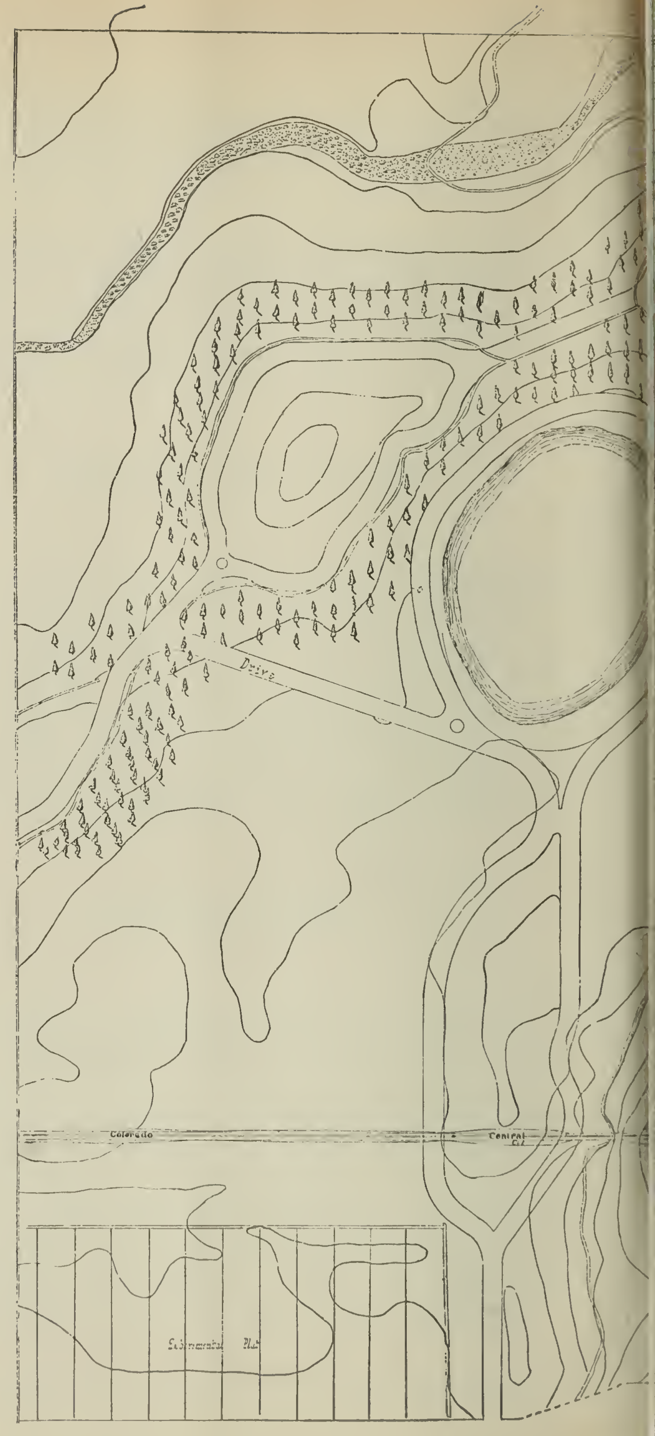
CLASSIFICATION.—Students enrolled in this catalogue are placed in the class in which they recite, unless they are behind one year in one line of work, or its equivalent, when they are placed with the lower class. Hereafter, each class in the college as catalogued (except the preparatory) shall contain only the names of those students who have completed the full work of such class to date of issue. Those who fail must be ranked with the next lower class.

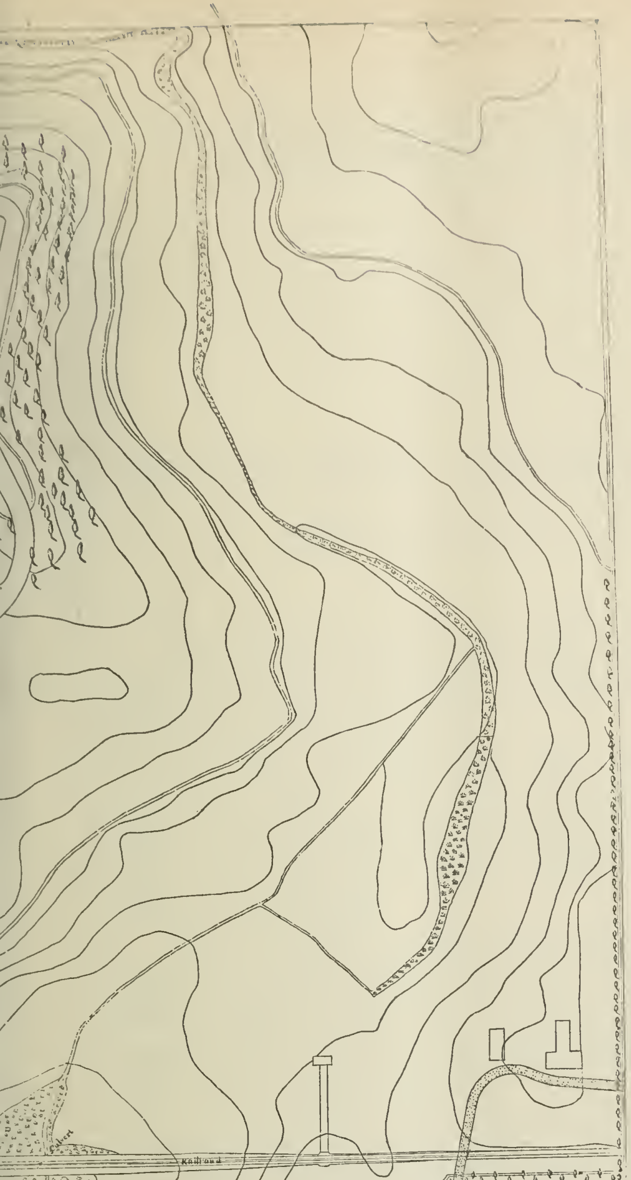
RHETORICALS.

Each class in the college must have public rhetorical exercises at least once each term. These exercises for the three upper classes will consist of original productions, as orations and essays, at the discretion of the officer in charge. For the remaining two classes the exercises shall consist of declamations, recitations and essays, as assigned. Any failure to keep up this part of the work will be considered and treated as failure in a study.

SOCIETIES.

There are two literary societies connected with the college, in which good and effective literary work is being done: the Philalethian society for young men, and the Æsthesian for young ladies. The character of the work performed in the societies is showing in the college work, and a higher plane of thought, feeling and action is seen each year. The former is two years old. The latter has done only one year of separate and distinct work; it has a comfortable room, which the society has neatly fitted and furnished, in which to hold its weekly meetings.


Drive
Colorado
Central
Plat



Plat of the
ltural College
Grounds

MEANS FOR INSTRUCTION

AND ILLUSTRATION.

The college hall, with chapel, drawing room, library and reading room, museum and office of president and secretary, besides five recitation rooms, armory, society room, rooms for storage, etc.

The chemical laboratory, with lecture room for thirty-five students; also work or analytic room, with desks for twenty students, each desk being supplied with water and gas for use of each student, and convenient hoods for ventilation.

The conservatory, 20x50 feet, with curve roof and 1,500 feet of glass, containing about 500 species or 10,000 plants, representing many interesting and rare botanical families; also, with potting room attached, and heated by improved hot water apparatus manufactured by Hitchings & Co., of New York.

The orchards and grounds, carefully laid out and planted to ornamental shrubs and trees, the planting of forestry and the propagating ground of the same, the kitchen garden, with its many varieties of vegetables and small fruits, hot beds and cold frames.

The mechanic shop, consisting of main building, 25x56 feet, and two stories in height, with a rear portion

20x62 feet, of one story. The upper floor of the main building is fitted up with benches for sixteen students in wood work; desks and tools for ten students in wood carving, and four wood-turning lathes; also, an iron-frame buzz saw, manufactured by Witherby, Rugg & Richardson, and complete in the range of work it can be made to accomplish. The lower floor contains an iron-working room, with sixteen benches for working in filing, etc., a very complete George L. Cady iron lathe, with attachments for a wide range of work; also, a room for office (now stores students' work), and a wash-room, besides a wide hall, in which stands the twelve-horse power engine, and from which rise the stairs to the floor above. The rear portion contains boiler and coal room, forge shop, with five forges furnished with blast from a fine Sturtevant rotary blower, a present from the manufacturers in Boston, and a foundry room, not yet fitted for work. The machinery and appliances throughout are first-class in every respect. A No. 1½ steam pump was donated to the department in March by the Geo. F. Blake Manufacturing Company, of Boston, Mass.

The farm of 240 acres, with a large part under cultivation, including the experimental ground of eight acres, containing twenty-five series of plats of seventeen in each series, each plat containing two square rods. The whole ground is surrounded and the plats divided by convenient drives and walks. In stock, we have Jersey cattle and Berkshire swine; also, Italian bees.

Connected with the department of Physics and Chemistry, we have a full set of meteorological instruments, by which observations are taken three times daily, and regular monthly reports are made out and transmitted to Washington, D. C.; also, the full set of standard weights and measures recently prepared for each of the Agricultural colleges of the United States, according to joint resolution of Congress to that effect.

The military department is supplied by the state with thirty stand of arms, for practice in military drill.

The scientific department is supplied with a fine cabinet of specimens illustrating geology and mineralogy. This collection was largely augmented by donations from many of the Exposition Commissioners last fall.

Skeletons, to illustrate the various types of vertebrates in zoology and also comparative anatomy. These include skeletons of bird, fish, tortoise, salamander, serpent and frog, as well as the human skeleton for comparative study. Also, *papier mache* models showing thorax, section of lung—lung removable,—heart, opening in sections showing position of valves and cavities. Models showing brain in section, and spinal cord with pairs of branches. A collection of 102 species of marine invertebrates has also been added from the Smithsonian Institute at Washington, and many species of our animals, birds and reptiles have been added within a year. This department has also fine microscopes for class work and research, imported from the well-known makers, Beck & Beck, of London, Eng.

The mathematical department is supplied with a good engineer's transit; a Wye level (15 inch), rod, chain, etc., for practical field work in surveying and engineering. Also, a fine water meter, presented to this department this season by the Equitable Water Meter Company, Boston.

LOCATION.

Fort Collins, the site of the college, is a fine town of about 3,000 inhabitants, and the county seat of Larimer county.

It is situated in the beautiful and fertile valley of the Cache la-Poudre river, just after it emerges from the foothills which skirt the snowy range. Extended views of the foothills and the ranges greet the eye, stretching away to the north and south, and culminating in Long's Peak, with its twin points, which seem like sentinels to guard this portion of the range. In other directions stretch away before you field on field of growing grain and gardens of fruits and vegetables. For healthfulness the location cannot be surpassed. There are fewer and less disastrous storms and sudden changes than at any other point on the slope.

The town is having a thriving and steady growth, is well governed, and more orderly than most towns of its size. The city council, this year, in order the better to promote law and order and the general welfare of the town, have by a stringent ordinance prohibited the sale or giving away of intoxicants within the town, or within one mile of the boundary thereof. This removes very largely all temptation to go astray, and parents can feel secure in sending their sons and daughters to our town and school, on account of this high stand the people of this city have taken, and which they propose to maintain.

The college is situated at the south side of town, on gently rising ground, which overlooks the major part of the town. It is connected with the city system of water works, by which good, pure water is furnished for all purposes. The various buildings are located on either side of the Colorado Central railroad track, and fronting on College avenue, the finest residence avenue in the city.

The town is easily accessible from all parts of the state by means of the Colorado Central and the Greeley, Salt Lake & Pacific Railroads, by which three passenger trains arrive and depart, daily, for Denver and intermediate points.

HISTORY.

The State Agricultural College of Colorado, in common with those of her older sister states, had its origin in an Act of Congress, passed July 2, 1862, which granted ninety thousand acres of land as an endowment fund for a college "where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, * * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

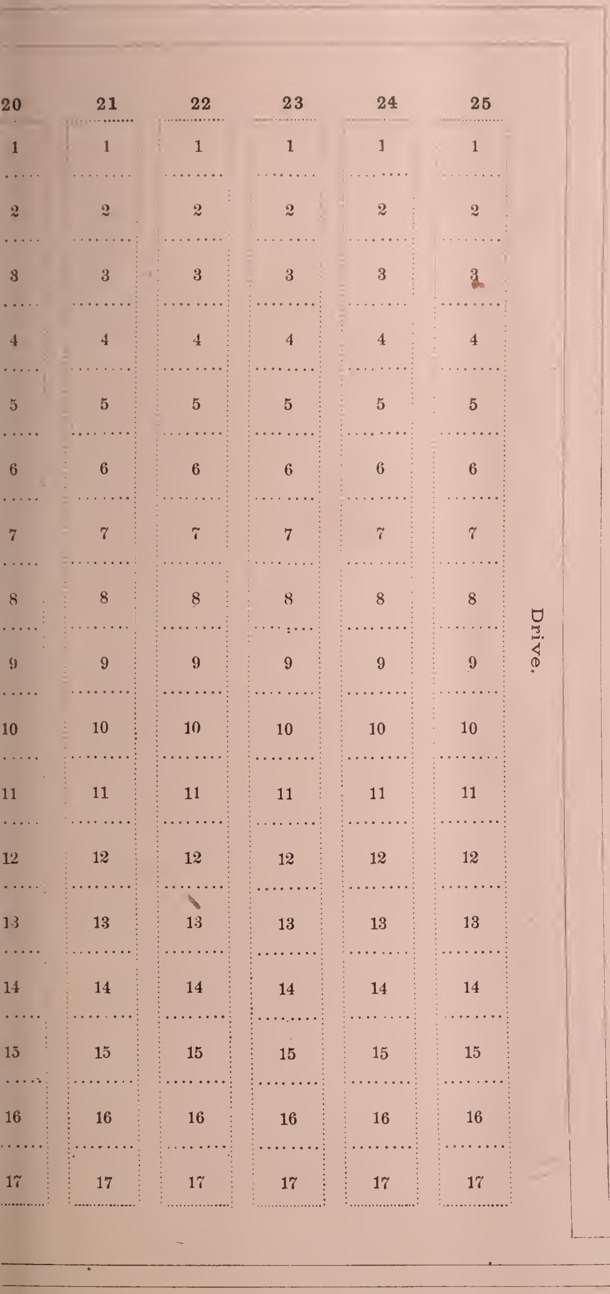
No benefit has as yet been received from this grant, but an Act of Congress, passed April 24, 1884, will soon give some revenue from this endowment.

The state has very generously supported the college by the passage of an act levying a tax of one-fifth mill on each dollar of valuation, and at the last Legislature this was made continuous. This gives the college a good endowment and promise of future growth and strength.

To the State Board of Agriculture, organized soon after Colorado became a state, was intrusted the work of building a college, and caring for the same. The town of Fort Collins was selected as its site, and at a meeting, held February 27, 1878, it was determined to erect a building suited to college purposes. The corner stone was laid July 29, 1878, and in the same year the building was completed. The college was not opened for the reception of students until September 1, 1879. The dormitory was erected in 1881, and the chemical laboratory in 1882, but not fitted thoroughly for work until May, 1883. A small propagating house was built in 1882, for the purpose of aiding Horticulture. The present greenhouse, with its curvilinear roof, and all modern appliances, completed September 1, 1883, is a long step in advance. On the same date the fine mechanic shop was completed, its machinery in order and ready to run.

The college now comprises the following distinct departments, viz: Agriculture, Horticulture, Botany, Physics and Chemistry, Mathematics and Engineering, Mechanics and Drawing, and Veterinary Science and Zoology; also, a Music department, more particularly for the accommodation of the young ladies, which was added April 1, 1884.

NDS.

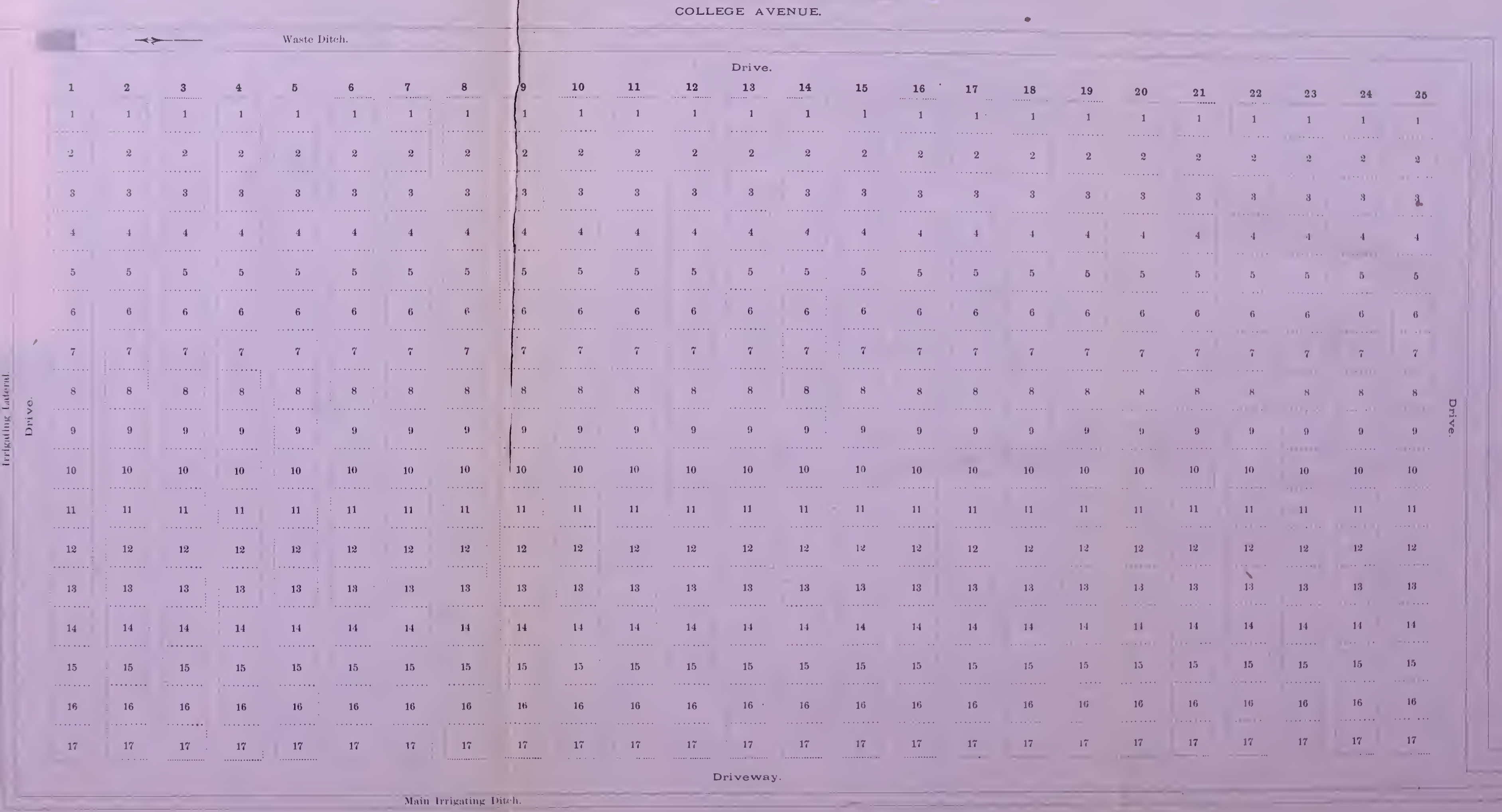


Each plat 34 rods long, 2 rods wide.
Each section contains 2 square rods.

Number of plats, 25.
Number of sections, 425.

Exact area, 8.68 acres.

COLLEGE FARM EXPERIMENTAL GROUNDS.



Each plat 34 rods long, 2 rods wide.
Each section contains 2 square rods.

Number of plats, 25.
Number of sections, 425.

Exact area, 5.68 acres.

EXPERIMENTS.

From the organization of the college, experiments have been planned and carried on, but mostly with cereals and grasses. These are being continued by the Agricultural department. The farm will be cultivated to some extent experimentally, but the greater part of the work will be performed upon the selected and platted experimental ground.

The Horticultural department is experimenting with many varieties of small fruits, in pomology, and forestry, having obtained much new stock, some directly from stock obtained by Professor Budd, of Iowa, in Russia. Experiments in garden culture and products are being made, in cross fertilization of some varieties to note results, and in testing the vitality of seeds.

The department of Chemistry is carrying on the observations in meteorology, and also a series of observations on soil temperatures, to further work and facts in Agricultural Chemistry.

The Engineering department is making experiments in flow and application of water, to assist in answering some of the vexing questions in irrigation.

LIBRARY AND READING ROOM.

The library has increased rapidly during 1883-4, and now contains about 700 volumes, and numerous pamphlets and unbound matter. The first thirty-five volumes of the *Journal* of the Royal Agricultural Society of England were added in May, 1883, and an equal number of *Littel's Living Age*, in September. The reading room is well supplied with papers and magazines, the list comprising: The *American Agriculturist, Country Gentleman, Rural New Yorker, Breeder's Live Stock Journal, Farmer's Home Journal, Iowa Homestead, Journal of Comparative Anatomy and Surgery, Wallace's Monthly, National Live Stock Journal, Breeder's Gazette, The Industrialist*, New Orleans *Times-Democrat, Colorado Farmer, Northwestern Live Stock Journal, The Engineering Journal, The Surveyor, The Century, Harper's Monthly, Princeton Review, North American Review, Popular Science Monthly, The Naturalist, Scientific American* and *Supplement, Gardener's Monthly, Gardener's Chronicle, The American Miller*, Denver *Daily News*, Greeley *Tribune* and *Sun*, Longmont *Ledger*, Loveland *Reporter, The Million*, Golden *Globe*, Fort Collins *Weekly Express, Weekly Courier*, and others. Many of the above are donations, either from the publishers or members of the faculty, or other interested persons. During this year, the room has been open for the benefit of students an average of eight hours a day for five days, and two hours each on Saturday and Sunday.

FARMERS' INSTITUTES.

Series of farmers' institutes have been held each winter since the organization of the college. At these meetings, lectures are given by members of the faculty and others, these being followed by discussions interesting and often of vital importance to the farmers.

The growth of the college during the few short years of its existence has been rapid and solid. The state has nobly done her share by contributing funds necessary to carry on the work. The attendance has been all that could be expected, and, although there is but one graduate class to point to with pride as the product of the work performed, yet out of the many who have attended, we feel that a goodly number have been better fitted for the work of life; that the dignity of labor has been upheld, and that when the college shall have attained age enough to send out more representatives, she will compare well with those colleges which have counted more years in their growth and labors.

DAILY ROUTINE.

(Saturday and Sunday excepted.)

Rousing bell,	6 A. M.
Breakfast,	7 A. M.
Class recitations or labor,	7:45 to 9:45 A. M.
Chapel exercises,	9:45 to 10 A. M.
Classes and labor,	10 to 12 M.
Military drill,	12 to 12:30 P. M.
Dinner,	12:30 P. M.
Classes and labor,	1:30 to 4:30 P. M.
Supper,	6 P. M.
Study hours,	7 to 10 P. M.

Saturday, library open from 10 to 12 A. M.; Sunday, from 2 to 4 P. M.

CALENDAR.

1884-85.

SEPTEMBER.

S	M	T	W	T	F	S
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14	15	16	17	18	19	20
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28	29	30	..	..	..	..
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OCTOBER.

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NOVEMBER.

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DECEMBER.

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JANUARY.

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FEBRUARY.

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MARCH.

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APRIL.

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MAY.

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31	..	..	..	..	..	..

JUNE.

S	M	T	W	T	F	S
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14	15	16	17	18	19	20
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28	29	30	..	..	..	..
..	..	..	..	..	..	..

CALENDAR.

COLORADO AGRICULTURAL COLLEGE.

1884.

Entrance examinations, - - -	Tuesday, September 9
First or Fall Term commences, -	Wednesday, September 10
First Term closes, - - -	Tuesday, December 23

First or Winter vacation.

1885.

Second or Winter Term commences,	Wednesday, January 7
Second Term closes, - - -	Tuesday, April 1

Second vacation.

Third or Spring Term commences, -	Wednesday, April 8
Baccalaureate address, in College chapel, -	Sunday, June 7
Closing examinations of the year, - -	June 8 and 9
Address before societies, - - - - -	June 10
Commencement, - - - - - -	June 11

Summer vacation.

REGISTER

OF THE

OFFICERS AND STUDENTS

AND

COURSES OF INSTRUCTION

IN THE

State Agricultural College,

FORT COLLINS, COLO.

1885-6.

MEMBERS

OF THE

STATE BOARD OF AGRICULTURE.

	Term Expires.
HON. R. A. SOUTHWORTH, Denver,	1893.
HON. G. E. WYMAN, Longmont,	1893.
HON. B. S. LAGRANGE, Greeley,	1891.
HON. W. F. WATROUS, Fort Collins,	1891.
HON. JOHN J. RYAN, Loveland,	1889.
HON. HENRY FOOTE, Del Norte,	1889.
HON. DAVID BOYD, Greeley,	1887.
HON. ORZO BRACKET, Frankstown,	1887.
HIS EXCELLENCY GOV. BEN. H. EATON,	*Ex-Officio.*
PRESIDENT CHARLES L. INGERSOLL,	

20830

OFFICERS OF STATE BOARD.

HON. DAVID BOYD, President, HON. W. F. WATROUS, Secretary,
HON. GEO. R. SWALLOW, (ex-officio) Treasurer.

COMMITTEES.

FINANCES.

W. F. Watrous, O. Bracket, John J. Ryan.

FARM AND EXPERIMENTAL GROUND.

B. S. LaGrange, G. E. Wyman, O. Bracket.

HORTICULTURE AND GROUNDS.

W. F. Watrous, R. A. Southworth, Henry Foote.

COLLEGE BUILDINGS.

B. S. LaGrange, Henry Foote, W. F. Watrous.

VETERINARY SCIENCE AND STOCK.

R. A. Southworth, O. Bracket, John J. Ryan.

MECHANICS AND CHEMISTRY.

G. E. Wyman, Henry Foote, O. Bracket.

MATHEMATICS AND ENGINEERING.

John J. Ryan, B. S. LaGrange, R. A. Southworth.

FACULTY, TEXT-BOOKS AND COURSE OF STUDY.

Henry Foote, R. A. Southworth, G. E. Wyman.

FACULTY OF INSTRUCTION.

CHARLES L. INGERSOLL, M. S.,
President, Professor of Political Economy and Logic.

AINSWORTH E. BLOUNT, A. M.,
Professor of Agriculture, Superintendent of Farm.

CHARLES F. DAVIS, M. S.,
Professor of Chemistry.

JAMES CASSIDY,
Professor of Botany and Horticulture, Superintendent of Department.

JAMES W. LAWRENCE,
Professor of Mechanics and Drawing.

GEORGE C. FAVILLE, B. S., D. V. M.,
Professor of Veterinary Science; State Veterinarian.

LIEUT. VASA E. STOLBRAND, Late U. S. Army,
Professor of Mathematics and Military Science.

ELIZABETH G. BELL,
Professor of English, History and Modern Languages.

ELWOOD MEAD, B. S., C. E.,
Professor of Physics and Engineering.

GRACE PATTON, B. S.,
Instructor in College and Preparatory Department.

*ELLA SILCOTT,
Instructor in Vocal and Instrumental Music.

HON. W. F. WATROUS,
Secretary of State Board and Faculty.

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*Department closed January 1st, 1886.

REGISTER OF STUDENTS.

POST GRADUATES.

Buchli, B., B. S., Kansas Ag'rl College, Veterinary Science and Chemistry.	*Alma,*	*Kas.*
Patton, Grace, B. S., Chemistry and French.	Fort Collins,	Colo.

SENIOR CLASS.

Sickman, Wilbert J.,	Fort Collins,	Colo.

JUNIOR CLASS.

Gill, Eleanor F.,	Fort Collins,	Colo.
Nettleton, Edwin G.,	Denver,	"
Stratton, Daisy E.,	Fort Collins,	Colo.
Stratton, Lerah G.,	"	"

SOPHOMORE CLASS.

Barker, George W.,	Denver,	Colo.
Griffin, Harvey H.,	Island Station,	"
Lee, Josephine,	*Mt. Ayr,*	*Iowa.*
Livingston, George V.	Fort Collins,	Colo.
Vollintine, Mabel,	"	"

FRESHMAN CLASS.

Bowlin, Eurilla H.,	Pueblo,	Colo.
Burns, Alana L.,	Fort Collins,	“
Coffin, Lewis A.,	Longmont,	“
Cook, Anna,	Fort Collins,	“
Coy, Fanny E.,	“	“
Davis, Arthur L.,	Arvada,	“
Davis, Cora B.,	Fort Collins,	“
Duncan, Charles A.,	Timnath,	“
Garbutt, Newton C.,	La Porte,	“
Golding-Dwyre, Effie,	Fort Collins,	“
Griffin, George M.,	Island Station,	“
Hazzard, Albert G.,	“	“
Hice, Lida,	Fort Collins,	“
Inglefield, Maud J.,	“	“
Loomis, Guy,	“	“
Maxwell, Clint J.,	Boulder,	“
McGee, Lulu M.,	*Granite Canon,*	*Wyo. Ter.*
McNeal, Ellett,	Denver,	Colo.
McLain, Genevieve E.,	Timnath,	“
Peterman, Dora E.,	Fort Collins,	“
Plumb, Nettie M.,	Erie,	“
Ramsey, William A.,	Denver,	“
Smith, Edward L.,	Loveland,	“
Southworth, L. Maude,	Denver,	“
Suiter, Edward F.,	Fort Collins,	“
Vandewark, Floyd,	“	“
Wilkins, Clara A.,	“	“

PREPARATORY CLASS.

Barron, Robert W.,	*Larimie City,*	*Wyo. Ter.*
Bates, Josephine,	Box Elder,	Colo.
Brown, Clarence R.,	Fort Collins,	“
Buffum, Bert C.,	Buckhorn,	“
Cocks, Thomas G.,	Jamestown,	“
Dye, Horace B.,	Rocky Ford,	“
Evans, Alma B.,	Loveland,	“
Furniss, Edward C.,	Hillside,	“
Hawkins, U. S.,	Loveland,	“
Harrington, Mattie,	Rocky Ford,	“
Johnson, Lee,	Estes Park,	“
Kelly, Ben.,	*Cheyenne,*	*Wyo. Ter.*
Kelly, Kate,	“	“
Kern, Edgar L.,	Timnath,	Colo.
Kern, John W.,	“	“
Lyon, Roy,	Denver,	“
McClelland, Henri S.,	Fort Collins,	“
McClelland, J. Horace,	“	“
McKissick, John W.,	Longmont,	“
McLain, Don. C.,	Timnath,	“
McLain, Minnie,	“	“
Osborn, Cora B.,	Loveland,	“
Penoyer, Mary,	Pinewood,	“
Sainsbury, Mattie,	Fort Collins,	“
Stephens, Herbert A.,	Longmont,	“
Suiter, Charles,	Fort Collins,	“
Temple, Frank L.,	*Chico Springs,*	*N. Mex.*
Temple, Harry R.,	“	“
Vail, Edward,	Fort Collins,	Colo.
Wells, Marcus E.,	Castle Rock,	“

IRREGULAR AND SPECIAL STUDENTS.

Bell, Annie,	*Chester*,	*N. H.*
Blount, Nettie M.,	Fort Collins,	Colo.
Carpenter, George,	"	"
Cline, Parker E.,	Denver,	"
Corcoran, Josie,	*Anamora*,	*Iowa.*
Ernest, Carrie,	Fort Collins,	Colo.
Faville, Julia A.,	*Osage*,	*Iowa.*
Foster, Agnes E.,	Fort Collins,	Colo.
Flescher, Mrs. L.,	"	"
Gifford, Mrs. F.,	"	"
Hoag, Margaret J.,	"	"
Lee, Rose,	*Mt. Ayr*,	*Iowa.*
McKinley, Thomas W.,	Fort Collins,	Colo.
McKissick, Alice,	Longmont,	"
McKissick, Oliver,	"	"
Post, Lillian E.,	Fort Collins,	"
Silcott, Adah,	"	"
Silcott, Lillie M.,	"	"

RECAPITULATION.

Post Graduates	2
Seniors	1
Juniors	4
Sophomores	5
Freshmen	27
TOTAL	39
Preparatory	30
Irregular and Special	18
TOTAL	87

STATES AND TERRITORIES REPRESENTED.

Colorado, by Post Offices	18
Iowa, "	3
Kansas, "	1
New Hampshire, "	1
Wyoming Ter., "	3
New Mexico, "	1
TOTAL	27

COLORADO REPRESENTED BY *Larimer*, *Boulder*, *Weld*, *Jefferson*, *Arapahoe*, *Douglass*, *Pueblo*, *Bent*, *and Custer Counties.*

Gentlemen	45
Ladies	42
TOTAL	87

COURSE OF STUDY AND LABOR.

PREPARATORY YEAR.

FIRST TERM.

Arithmetic,	Sandford's Analytical
Physical Geography,	Houston
English Analysis,	Kellogg

Labor, two hours, farm or garden.

SECOND TERM.

Arithmetic,	Sandford's Analytical
U. S. History,	Johnston
Word Analysis,	Swinton

Labor, two hours, shop practice.

THIRD TERM.

Algebra,	Olney
U. S. History,	Johnston
Elocution,	Fenno

Labor, two hours, farm or garden.

Military Drill, four exercises a week.

Penmanship, one exercise a week, at same hour.

FRESHMAN YEAR.

FIRST TERM.

Algebra,	Olney
Ancient History,	Swinton
Book Keeping,	Meservey

Labor, two hours, farm or garden.

SECOND TERM.

Algebra,	Olney
Ancient History, ½ term,	Swinton
English Literature, ½ term,	Shaw
Botany,	Gray, with Coulter's Flora

Labor, two hours, shop practice.

THIRD TERM.

Geometry,	Wentworth
English Literature,	Shaw
Botany,	Gray, with Coulter's Flora

Labor, two hours, farm or garden.

Military drill, four exercises a week.

Composition, one exercise a week, at same hour.

SOPHOMORE YEAR.

FIRST TERM.

Geometry,	Wentworth
Chemistry,	Lectures
Drawing,	Lectures and Practice

Labor, two hours, Chemical Laboratory practice.

SECOND TERM.

Trigonometry,	Wentworth
{ Chemistry, Organic, ½ Term,	Lectures
{ Physiology, ½ Term,	Martin
Drawing,	Lectures and Practice

Labor, two hours, shop practice.

THIRD TERM.

Surveying,	Gillespie
Physiology,	Martin
Drawing,	Lectures and Practice

Labor, two hours, field surveys, etc.

Military Drill, four exercises a week.

U. S. Constitution and Government, one lesson a week, at same hour.

N. B.—From this point the course has two required lines of study and labor, and an opportunity to elect between—Irrigation Engineering, Mechanics and Drawing, Veterinary Science, or Language, for the third line. The required studies in each case are named first.

JUNIOR YEAR.

FIRST TERM.

Physics,	Kimball's Olmstead
Zoology,	Packard

Electives.

Hydraulics,	Farming
Drawing,	Architectural and Machine
German.	

SECOND TERM.

Physics,	Lectures
Geology,	Le Conte

Electives.

Agricultural Chemistry,	Lectures
Drawing,	Architectural and Machine
German.	

THIRD TERM.

Physics,	Lectures
Agriculture, or	Lectures
Entomology,	Lectures

Electives.

Reservoirs,	Lectures
Drawing,	Architectural and Machine
German.	

Labor, two hours daily, through the year, in Field work, in Engineering, Shop, Chemical Laboratory, or upon Farm or Garden; the Election to be in consonance with the course of study selected.

SENIOR YEAR.

FIRST TERM.

Phychology,	Porter's Human Intellect
Agriculture,	Lectures
Landscape Gardening, or	Kemp
French,	

Electives.

Canal Work,	Lectures
Steam Engine, Structure, etc.,	Lectures
Veterinary Science,	Lectures
German.	

SECOND TERM.

Logic,	Fowler
Horticulture, or	Lectures
French.	

Electives.

Irrigation Law,	Lectures
Power, Transmission of, etc.,	Lectures
Veterinary Science,	Low
German.	

THIRD TERM.

Political Economy,	Wayland-Chapin
Floriculture,	Lectures
Entomology, or	Lectures
French.	

Electives.

Astronomy,	Lockyer
Special Machines, etc.,	Lectures
Veterinary Science,	Law and Lectures
German.	

Labor, two hours, three exercises a week, in consonance with course selected. Two exercises a week in Microscopy, through the year, with Thesis at the close, for all except those students who elect the course in Mechanics and Drawing; these have five exercises a week in shop.

DEPARTMENTS OF

INSTRUCTION AND LABOR.

AGRICULTURE.

The study is pursued by a course of lectures in the third term of the junior year, in which are discussed the various breeds of horses, cattle, sheep, swine and poultry; their peculiarities, history, adaptation, etc., etc.; cereals, preparation of soil, seeding, harvesting, threshing, marketing; laying out a farm, improvements; farm and public roads, bridges, culverts; location and erection of buildings.

In the senior year, the student is given more instruction in this line after he has pursued thoroughly those branches of science which underlie or are closely related to agriculture.

Farm yard manures, their application and utility; irrigation and its application; dairy husbandry; farm accounts; rotation of crops; drainage; farm implements; improvement of cereals by selection, crossing and care; and the careful employment and superintendence of labor.

Students labor upon the farm and at the experimental ground two hours daily on each school day. " Labor and study, theory and practice go hand in hand. To know how and when to do work well is a science; to acquire the skill is an art. That they may obtain the science, study is necessary; to get the art, work is indispensable."

BOTANY.

The instruction in botany is very full and complete, commencing with the study of vegetable physiology and proceeding to structural and systematic botany. After a thorough study of principles, the students are required to study the plants, and in this way to fix in their minds the principles before so thoroughly scanned. Two terms of the freshman year are devoted to the foregoing work. The new green house, completed September 1st, 1883, furnishes ample material for work, and, distributed over a large number of botanical families, our facilities for instruction in this branch are unsurpassed. In the senior year, the students take up the work of microscopy, in which the study of histology is pursued. Many plants and organs are examined by section, and the student required to make drawings and permanent mountings of the same. In this manner, the students become prepared to make independent investigations in various directions, in after life.

CHEMISTRY.

It is the object of this department to give the student an opportunity to acquire a thorough mastery of the elementary principles of the chemical science. To attain this object, the theory and practice are made to go hand in hand. In the first term of the sophomore year, the class listens to a series of lectures upon the general theory of the science, its history and development. In this course of lectures are discussed the subjects of acids, bases and salts, and the principles of the chemical philosophy. The nature, history and compounds of each of the elements are discussed in detail, the whole being enforced by numerous experiments. While taking this course, the student spends two hours each day in the work-room, repeating the experiments shown in class, and others which may be suggested, and prepares a series of substances by the synthetic process. This labor serves to familiarize the student with various forms of crystals, the marked distinction between various classes of salts, the use of the nomenclatures, and the manipulation of apparatus.

In the second term of the sophomore year, there is given a course of lectures on Organic Chemistry, continuing for six weeks, one hour daily.

In the second term of the junior year, the student listens to a course of lectures upon Agricultural Chemistry, in which are discussed such subjects as the following: Relation of chemistry to agriculture, the literature of Agricultural Chemistry ; elements of plant growth, their relative abundance and importance ; the atmosphere, the soil, fertilizers, etc.

During this term the class spends two hours daily in the work room, where the students pursue the study of qualitative analysis, by precipitation, and a short practice in volumetric analysis. Practice in the use of the blow-pipe accompanies this work, and an insight into determinative mineralogy is thus acquired. The student will also make a few determinations quantitatively of the relative ash of plants ; the water and organic matter of plants, and at least one ultimate analysis of soil.

Keeping in mind the objects for which our college is founded, we have so planned our chemical course as to prepare the student for the general application of chemistry in its relation to the industrial arts, while seeking especially to thoroughly ground him in the application of the science to agriculture.

PHYSICS.

The study of Mechanical and Chemical Physics will continue during the junior year. The first term will be devoted to the study from text-book of the mechanics of solids. The second term will be given to the subjects of Hydrostatics, Pneumatics, Acoustics and Optics, by lecture. In the last term will be given the subjects of Heat, Electricity and Magnetism, from the standpoint of Chemical Physics. The whole study of Physics will be illustrated, where practicable, by apparatus and experiment.

HORTICULTURE.

Instruction in the several branches of Horticulture is given as follows: In practical Floriculture, by lectures upon such topics as the construction, heating and management of green houses; the propagation of plants by seeds, cuttings, layers, budding and grafting; how budding and grafting are done, and its uses; the cultivation and general management of green house plants for commercial or private purposes; insects and diseases of plants under glass, with remedies therefor; parlor gardening, Wardian cases and ferneries; arrangement of flowers in bouquets and floral designs.

Instruction in Pomology is given by lectures, and embraces a theoretical and practical study of the propagation, planting, pruning and general management of orchards and small fruit gardens; insect enemies, diseases and varieties best adapted to this latitude; classification of fruits by form, habit of growth, flowers and leaves.

Vegetable Culture comprises kitchen and market gardening, and seed growing; and the principal topics considered are: The best situation for, and the laying out of the garden with a view to its irrigation, and most economical management in the rotation and planting of crops for the family and for market; management of composts and commercial fertilizers; care of tools; selection and growing of seeds; construction, management and uses of hot-beds and cold-frames; harvesting, marketing and storing of fruits and vegetables.

Forestry is taught by lecture, special attention being given to such topics as the value of trees and shrubs for timber and ornament, for hedges, screens and shelter belts for this State; the best methods of culture, with a history of varieties, especially such as are thought worthy of trial in this latitude.

Landscape Gardening is taught in the senior year by regular study of text-book: Kemp's "How to Lay Out a Garden," and lectures, adapted as much as possible to the exigencies of this climate; frequent use being made of the grounds, and their planting, for illustration. The orchards, nursery, green house, vegetable garden and flower garden afford ample opportunity to the student to acquire a practical acquaintance with the above topics. Each student before completing the study must complete a formal plat, arranged with reference to the best principles of the art.

MATHEMATICS.

The instruction offered by this department is designed to conform to the general aim and purpose of the institution; accordingly, only those branches of pure mathematics are taught, which the student will find of greatest service in after life. The instruction in this portion of the subject being about the same as that of classical colleges, while the attention given to applied mathematics, including surveying and engineering, is much greater than that of the usual college course.

Arithmetic.—Students entering the preparatory year in the first and second terms pay special attention to decimal notation and general analysis, covering the several departments of commercial arithmetic.

Algebra.—The study of Algebra occupies the last term of the preparatory year, and the first and second terms of the freshman year. In the first term the principal object is to thoroughly familiarize the pupil with the use of literal quantities and the processes of factoring. The second term's work is largely devoted to the study of the equation, and its uses in the solution of intricate problems in interest, common discount and alligation, and for the demonstration of geometrical and trigonometrical theorems. The last term is given to Higher Algebra. Through this study two objects are kept prominently in view: First, to give the pupil facility in the use of algebraic processes, and second, to train him to methods of reasoning rather than operating.

Geometry is placed in the third term of the freshman year and the first term of the sophomore year. Problems in mensuration and original exercises will be added to the routine text-book work, giving the student frequent practice in the application of principles already acquired, and enabling him to fix more firmly the knowledge gained.

Trigonometry and Surveying —Trigonometry is taught during the second term of the sophomore year. This is followed in the third term by surveying; the instruction in which will be in part by lectures, and includes theory, adjustment and use of instruments, history and methods of the U. S. Government surveys. In addition to the class-room exercises, the students will be required to devote from two to three hours daily to practice in the field. They will take their own notes, from which they will be required to submit computations, accompanied by drawings made to scale.

IRRIGATION ENGINEERING.—This special course commences with the study of Hydraulics in the junior year. The text-book is " J. T. Fanning's Treatise on Hydraulic and Water-Supply Engineering," and is very complete in its 600 octavo pages, which treat of all phases of the subject. The course is continued in the spring term by a study of reservoirs and the construction of bulkheads and flumes. The text-book used is on the " Design and Construction of Dock-Walls," by J. Romilly Allen. With the first term of the senior year begins a series of lectures on " Canal Work," and, in the winter term, on " Irrigation Law," etc., the whole making a very complete study of the whole subject. The idea is, to enable the student, with the training received before the junior year, to locate a canal, estimate its capacity theoretically, and then practically to give the quantity of water passing over weirs or through apertures of all dimensions.

MILITARY SCIENCE.

The instruction offered by this department, created at the annual meeting of the Board of Agriculture, held in 1884, and filled by the election of a lieutenant of the regular army, is intended to conform not only to United States and State laws, but to accustom the student to habits of prompt yet not machine obedience ; to foster and cultivate the ardor and the natural martial instinct so inherent in our national character; to teach him the why and wherefore of, obedience first,—questioning, if any, afterwards—(the maxim so necessary to be observed in all military operations); and to prepare him should necessity arise, to organize and drill a company or battallion of our national mainstay—the citizen soldiery.

In the fall and spring terms 45 minutes daily are devoted to practical application of the theory of the Infantry Tactics as expounded and illustrated in the class room in the winter term. These daily drills assume more the character of a recreation than a task.

The uniform, which will be required of each male student next year, is modeled somewhat after the fatigue uniform of the regular army; it is neat and comprises coat, pants, cap and gloves, and is substantial but not costly.

Military drill is required of each male student for three years unless excused for physical disability or by special vote of the faculty for special satisfactory reasons.

PRACTICAL MECHANICS.

The old system of apprenticeship is rapidly becoming a thing of the past, and it is now almost impossible for a boy to learn a trade in any modern shop or factory. This is owing, largely, to the introduction of special machinery, necessitating special workmen to manage it, and the workman who has learned to run a machine of this kind is kept at that work, as being most profitable to his employer; his practical knowledge of other methods and machines is, therefore, confined to narrow limits, and, should a vacancy occur in a superior position, he is not the man for the place, from the fact of his being unacquainted with other practical parts connected with his trade, the manipulations and principles involved in which he has not had an opportunity to learn.

This department has for its object a systematic and progressive education in the use of tools and materials, combined with as much theoretical knowledge as shall be deemed necessary to properly explain the principles involved. It does not teach special trades, nor manufacture salable articles ; to do so would require that the student be kept on the kind of work he could do best, and thus prevent him from acquiring broad and liberal ideas of other methods. So, without teaching any one complete trade, the mechanical principles of many are gained. This does not necessarily mean that the student becomes sufficiently expert to compete with the skilled mechanic, but that a knowledge of *how* a tool or machine should be used, and the manner of *laying out work* for the same is thoroughly taught.

Although it is not expected that all students are to become mechanics, yet such a training cannot but make its salutary effects felt in whatever walk of life may be chosen.

Should his surroundings be such that he enters manufacturing, his ideas having been broadened by this training, the student will the more readily grasp anything new that may come up in his business, or, if he takes up farming, he will, with greater ease, be able to understand the mechanical principles and workings of his machinery, and also how to keep them and his buildings in proper repair.

The shop instruction will be divided in courses as follows, and in each course will be given, in connection with the work, an explanation of the construction of each tool, its manner of acting on the material, and methods of de termining how to select materials best suited to different kinds of work, and manner of laying out work, cutting speed tools, etc.

COURSE OF LABOR.

Bench work in wood,	12 weeks	1st year.
Machine work in wood,	4 weeks	
Pattern making and foundry work,	12 weeks	
Vise work in iron,	10 weeks	
Iron forging,	14 weeks	2d year.
Steel forging,	4 weeks	
Machine work in iron,	20 weeks	

Bench Work in Wood.—This course will consist of exercises with the different wood working bench tools, so arranged in a graded series as to embrace the manipulation of the tools in their various applications.

First—The use of the planes in jointing, smoothing and getting the piece out of wind, lining off, and the use of the saws in cutting across and with the grain and keeping to line.

Second—Halved splice.

Third—Splayed splice.

Fourth—Keyed splice.

Fifth—Open dovetail mortise and tenon joint.

Sixth—Mortise and tenon joint.

Seventh—Open dovetail joint.

Eighth—Blind dovetail joint.

Ninth—Lap joint.

Tenth—Dowel joint.

Eleventh—Small newel-post with hand-worked rail.

Twelfth—Panel door.

Thirteenth—Roof truss.

Fourteenth—Box.

Fifteenth—Carpenter's trestle.

MACHINE WORK IN WOOD.—In connection with this course, with the use of tools, will be given the most rapid and economical method of selecting and preparing the wood for the machine. There will be given examples of

First—Straight turning.

Second—Cutting-in and squaring-off.

Third—Convex, concave and compound curves.

Fourth—Handles for chisels and other tools.

Fifth—Examples in chuck-work in separate and combined pieces.

Sixth—How to turn a ball.

Some of these pieces will be used in connection with ornamental scroll-sawing.

PATTERN MAKING AND FOUNDRY WORK.—After becoming familiar with bench and machine work in wood, an application of both is made, by constructing patterns with due regard to shrinkage, draft and the best method of constructing the pattern, so that it causes the least amount of trouble in the foundry. There will be given examples of

Plain work.

Core work.

Pulley work.

Pipe work.

Gear work.

Core boxes, their uses and construction.

And in the foundry will be given practice in moulding in plain and core and management of the furnace and core oven.

VISE WORK IN IRON.—With this course will be given an explanation of the different kinds of tools and their effect on the material, and the style of tool to be selected for certain kinds of work. There will be given examples in

Chipping cast iron, wrought iron and steel.

Spline chipping.

Hack sawing.

Filing square and round surfaces to line.

Shoulder, point and other free hand filing.

Fitting joints.

Finishing and scraping.

FORGING IN IRON AND STEEL.—Care of the fire.

The effect of different heats on the material.

Drawing, upsetting, bending.

Scarf, fork, jump and other styles of welding.

Welding iron to iron, iron to steel, steel to steel.

Rings, chains, ring bolts, brackets, braces, heading-tools, nails, bolts, hooks, hasps, swivels, tongs.

Steel wrenches, cold chisels, drills, lathe tools, springs, etc., etc.

Examples in tempering and case-hardening.

MACHINE WORK IN IRON.—Care of the machines, their construction, proportion and use of the different parts.

Cutting speed of tools, and proper angle of cutting edge for different purposes and different metals.

Centering and straightening work.

Straight turning and squaring.

Boring.

Making and fitting joints.

Chuck-work.

Screw-cutting inside and outside.

Drilling, tapping and reaming.

Boring with boring-bar and use of center rest.

Polishing and finishing.

Hand-tool work.

DRAWING.

FIRST YEAR.

Geometrical problems.

Free-hand copy and dictation.

Designs.

Linear perspective.

Model and object drawing.

SECOND YEAR.

Orthographic and Isometric projections, and projection of shadows.

Development and intersection of surface.

Light and shade.

Historical ornament.

Wood carving, diaper, incised and relief.

Ornamentation of pottery, tiles, etc.

Persons having parts of machines, patterns, small models, or working drawing, may, if they choose to donate the same to the department, confer a great favor upon the college, and especially upon the department.

VETERINARY SCIENCE.

The department of Veterinary Science was introduced September 1, 1884. The course of study runs through the senior year. During the first term the class is given lectures upon the anatomy and physiology of the domestic animals, taking the horse as a type, and illustrating the lectures by means of anatomical models and actual dissections by the class. During the second term the course consists of lectures upon diseases and treatment and materia medica; the lectures being supplemented by the diagnosis of cases at the clinic, and actual practice in prescribing and compounding medicines for the cases presented. During the third term of the year the lectures upon diseases and treatment are concluded, and the class are given lectures upon veterinary sanitary science (the relation that diseased animals bear to the public health), and the management and care of breeding animals.

PHYSIOLOGY & COMPARATIVE ANATOMY.

The study is begun in the second term of the sophomore year, lectures being given on Anatomy, and followed by a thorough study of Physiology. Martin's "Human Body" is used as text-book, supplemented by lectures. The course covers one-half the sophomore year.

ZOOLOGY.

This branch of study is begun in the junior year and runs through fifteen weeks. The text-book used is "Packard's Zoology," briefer course, supplemented by lectures and museum work. The museum work consists of dissections and drawings and classification of animals. The college facilities in the way of skeletons and specimens of both marine and inland fauna are not equaled in the west, and additions are being constantly made.

Entomology.—This branch of Zoology is studied more completely in a course of lectures in the junior year, in which the subject of bee-keeping receives especial attention. The instruction deals largely, after the grouping and classification are disposed of, with the study of those species and genera of insects which are either beneficial or injurious to the agriculturist. In this connection are discussed the various known means and remedies of checking the ravages of those injurious. Some laboratory work will be required of each student.

MICROSCOPY.

In the senior year the student takes up the subject of Microscopy. In this work the student takes up the particular study of histology, completing the work begun in Botany, by a study of many of the fungii, and accompanying the study of Physiology and Anatomy by the microscopical study of the structure of organs. The laboratory is fitted with Beck's Economic microscopes, furnished with two eye-pieces, and one-half and one-sixth objectives, giving a magnifying power of from 60 to 800 diameters, and all the necessary apparatus for the best of scientific work. These instruments were imported from the well-known firm of R. & J. Beck, London, which is a sufficient guarantee of their quality. The object of this work is to fit the student to make independent investigations in various directions, and each student is required to work out carefully some particular topic in Biology, with careful notes, drawings and mounted specimens, which will be kept as the property of the institution.

These theses are carefully bound and preserved in the library.

ENGLISH.

The study is begun as a review of English analysis and continued by the study of word analysis in the preparatory year. The subject is carried forward by weekly class exercises in composition during the entire freshman year.

HISTORY AND LITERATURE.

The entire freshman year is devoted to these topics. The year begins with Ancient History, in which text-book and lectures intermingle in the use of the class when studying special epochs or periods. The last half of the year is devoted to English history and Cotemporaneous literature, interspersed with critical reading, from selected authors.

MENTAL AND MORAL SCIENCE.

These studies are pursued in the senior year, in such a manner as to give a good outline in each, which the student is expected to fill in largely by supplementary readings.

LOGIC.

The study of this branch is considered of prime importance, as in the presentation of the inductive we find the methods pursued for the advancement of science and the means of elimination of error from experiment. The term's work is equally divided between the inductive and the deductive method.

POLITICAL ECONOMY.

Wayland, lectures and discussions, are used. The short term only gives sufficient time to arouse an interest in the divisions of the subject, and leads the student to read and act intelligently on the questions which interest us as a nation in our growth and increase of wealth.

The study of the Constitution of the United States and of the State of Colorado both conjoin to make more broad the mind of the student and the better fit him to take his place among the citizens of this or other states.

These, with other subjects relating to civics, will be given by a series of exercises continuing through the sophomore year; and thus earlier in the college course will we strive to urge thought in the direction of good citizenship.

DEGREE.

Upon those who complete the work of the course as laid down, in a good and satisfactory manner, the State Board of Agriculture, upon recommendation of the faculty of instruction, confer the degree of Bachelor of Science. A finely engraved diploma is the form of the testimonial used, the fee for which and graduation is fixed at ten dollars, without other public expense to the student.

EXPENSES,

Matriculation (entrance fee, entitling the student to the privileges of the whole course),	$ 5 00
Incidental fee, per term	1 00
Board in dormitory (including room rent, heat and light), per week [about cost],	3 35
Graduation fee	10 00
Tuition free.	
Uniform	$15 to 20 00

Washing averages about 75 cents per dozen; and no laundry is connected with the college. The college has dormitory accommodations for thirty young men, and cannot take all. The college has no room for young ladies; the Board of Agriculture assigned the existing dormitory for the coming school year exclusively to the young men; hence young ladies seeking instruction here must find rooms and board in private families. Board can be obtained in private families at $4 to $6 a week, room rent included.

The rooms in the dormitory are each furnished with bedstead and stove; *students must furnish all else*, including straw ticks or mattresses. The conditions of occupancy are: Good conduct, a care and preservation of property, and a willing and cheerful obedience to the rules governing that part of the college.

TEXT-BOOKS.

Books should not be purchased until the student arrives at the college, and after consultation with the members of the faculty, as changes are liable to take place, or the proper edition may not be obtained. Booksellers in the city furnish books to students of the college at a reduced rate, by special arrangement.

TOTAL EXPENSES.

As some persons are desirous of knowing just what it may cost to attend school for a year, the following summary of approximate cost is made:

Matriculation fee (paid once)	$ 5 00
Incidentals, 3 terms	3 00
Board, 36 weeks, at $3.35 per week . .	120 60
Washing (average), 50 cents per week . .	18 00
Books (approximately)	15 00
	$161 60

The uniform is not mentioned in this estimate, as it costs no more than a good suit of citizen's clothes, and, consequently, will not increase the expense.

In terms where the students labor on farm and garden, their wages go to lessen their expenses, so that an average of $150 will pay the yearly expenses of a student during the whole course. The sophomore and junior years are a little more expensive than the others, as fees must be paid for use of chemicals and apparatus.

CHEMICAL FEES.

Sophomore year, first term	$ 5 00
Junior year, first and second terms	15 00
Total for chemical course	$20 00

SHOP FEE.

A shop fee of $5.00 per term is charged to cover cost of material, and breakage or damage of tools. A fee of $2.00 per term is charged for the course in wood carving.

ADVANCE PAYMENT.

All fees must be paid in advance, and a receipt obtained from the secretary entitles the bearer to admission to the classes. Board must be paid monthly in advance, and no reduction is made unless for absence of a full week at one time. In such case one-half the time is allowed. An absence of two consecutive weeks entitles one to full reduction of time. A student leaving before the end of the term has any excess or balance to his credit refunded to him on settlement.

CONDITIONS OF ADMISSION.

The college is open alike to students of either sex. Candidates for admission must be fifteen years of age, and unless personally known, must give good reference. They must also pass an examination in the common branches, viz.: Reading, Writing, Spelling, Grammar, Arithmetic and Geography. The work of the preparatory year is, in part, a thorough and practical review of Grammar and Arithmetic, with the additional subjects of U. S. History, Physical Geography, Elocution, Word Analysis and Penmanship; consequently, a candidate for admission to the freshman class must pass an examination in these branches, and not receive conditions in more than two of them. In no case can one be conditioned on the study of Arithmetic. Candidates for advanced classes or work must be examined on all previous work, or bring certificates of standing from schools having an equivalent grade of work.

REGULAR AND SPECIAL COURSES.

Unless there seem to be strong and excellent reasons for it, students will not be allowed to take a special course of study, and in case it is allowed, the student must show that he is well qualified to pursue the studies selected by passing such examinations as the faculty may assign. No student will be allowed to change his course during the progress of a term, nor will he be allowed to drop a study unless by permission of the faculty. A student cannot be allowed to leave college in term time without leave of absence granted by the president or faculty, otherwise the student will be liable to suspension or expulsion. Temporary leave of absence can be granted by the president, or the officer in charge during his absence. Final separation from college must be acted upon by the faculty.

ELECTIVE COURSES.

The adoption of the modified course of study whereby there are granted three lines of work and study in the junior year and four in the senior, will render unnecessary most of the requests for special courses. The reduction to three studies per term will also render the excuse null and void, that the work is too difficult.

LABOR.

The labor of students at the college is required by law; each student must labor two hours each school day, unless excused for physical disability. The labor at the college is of two classes: First, that which is performed for purpose of teaching the student; and second, that which is of some monetary value to the institution.

In the first class is placed all labor performed in chemical laboratory practice, in mechanic shop (work in wood or iron), and in field surveying and leveling, as well as some labor in greenhouse or conservatory. In the second class is included all labor upon the farm or garden, and extra time in mechanic shop, when the student has acquired a sufficient degree of skill. The rate paid for labor of the second class varies with the skill and fidelity of the student. The maximum price is ten cents per hour. It is believed that the students of the Agricultural College or of any industrial school are able to accomplish as much in the line of study as if no labor were performed. At the same time, the labor helps to keep the physical nature strong and healthy, while the student, by learning well the principles underlying many trades and vocations, is made strong to grapple with the duties and responsibilities of life, while being educated to take his place among the best and most honored of our citizens of the future. The time that in many colleges is spent in revelry or athletic sports, of questionable utility, is thus devoted to that which is not only a present benefit, by helping to support the student while in college, but gives him a ready means of support in many ways as soon as he leaves the college halls.

DISCIPLINE.

The discipline of the college is mild, but firm, and the faculty reserve the right to suspend pupils with or without the knowledge of the parents, according to the circumstances of the case. Good conduct is expected of all; and when it becomes manifest from the deportment of any student that his presence is detrimental to the best interests of the school, or when he fails to keep up a fair grade in his studies, such student will be removed.

DORMITORY REGULATIONS.

Young men are expected to be at the dormitory at 7 P. M. each evening, except Sunday, when they have permission to attend church if they choose. Study hours begin at 7 P. M. and close at 10 P. M. The time for retiring is fixed at 10:15 P. M.

Any marked violation of the above regulations will be followed by warning and advice; if still persisted in, the student will be suspended from the dormitory, if not from the college. Students boarding outside must obtain permission before visiting the dormitory. Damage to rooms or property about the dormitory will be assessed to the one occupying the room, or to the whole body of dormitory students if the responsible parties are unknown.

COLLEGE REGULATIONS.

Each student is expected to maintain a grade of 70, on a scale with 100 as perfect. Any student who fails to maintain this grade will be reported to the faculty by the professor in charge of such study or labor. It is then the duty of the president to announce such failure publicly before the school, after which such student shall have two weeks in which to raise his grade; at the end of this time, if such student fail to raise his grade, he shall be suspended from the school, unless sickness of the student or his friends interfere with his work, or there be some other equally extenuating circumstance, when the rule shall be inoperative.

CLASSIFICATION.—Students are classified in all college classes with reference to completed work; all students who fail in their work are classified in the next lower class until the full work of the specified year is completed.

SOCIETIES.

The young ladies of the school sustain a fine society for literary work. This society, the Æsthesian, secured an interesting public lecture during commencement week. It has a neatly furnished room in which it holds its weekly meetings.

MEANS FOR INSTRUCTION

AND ILLUSTRATION.

The college hall, with chapel, drawing room, library and reading room, museum and office of president and secretary, besides five recitation rooms, armory, society room, rooms for storage, etc.

The library of nearly 1,000 bound volumes, beside pamphlets, maps, magazines, papers, etc.

The chemical laboratory, with lecture room for thirty-five students; also work or analytic room, with desks for twenty students, each desk being supplied with the water and gas for use of each student, and convienent hoods for ventilation.

The conservatory, 20x50 feet, with curve roof and 1,500 feet of glass, containing about 500 species or 10,000 plants, representing many interesting and rare botanical families; also, with potting room attached, and heated by improved hot water apparatus.

The orchards and grounds, carefully laid out and planted to ornamental shrubs and trees, the planting of forestry and the propagating ground of the same, the kitchen garden, with its many varieties of vegetables and small fruits, hot beds and cold frames.

The mechanic shop, consisting of main building, 25x56 feet, and two stories in height, with a rear portion, 20x62 feet, of one story. The upper floor of the main building is fitted up with benches for sixteen students in wood work; desks and tools for ten students in wood carving, and four wood-turning lathes, also an iron-frame buzz saw, manufactured by Witherby, Rugg & Richardson, and complete in the range of work it can be made to accomplish. The lower floor contains an iron-working room, with sixteen benches for working in filing, etc.; a very complete George L. Cady iron lathe, with attachments for a wide range of work; also a room for office (now stores students' work), and a wash-room, besides a wide hall, in which stands the twelve-horse power engine, and from which rise the stairs to the floor above. The rear portion contains boiler and coal room, forge shop, with five forges furnished with blast from a fine Sturtevant rotary blower, a present from the manufacturers in Boston, and a foundry room, not yet fitted for work. The machinery and appliances throughout are first-class in every respect. A No. 1½ steam pump has been donated to the department by the Geo. F. Blake Manufacturing Company, of Boston, Mass.

The farm of 240 acres, with a large part under cultivation, including the experimental ground of eight acres, containing twenty-five series of plats of seventeen in each series, each plat containing two square rods. The whole ground is surrounded and the plats divided by convenient drives and walks. In stock we have Jersey cattle and Berkshire swine; also Italian bees.

Connected with the department of Physics, we have a full set of meteorological instruments, by which observations are taken three times daily, and regular monthly reports are made out and transmitted to Washington, D. C.; also, the full set of standard weights and measures recently prepared for each of the Agricultural colleges of the United States, according to joint resolution of Congress to that effect.

The military department is supplied by the State with thirty stand of arms for practice in military drill.

The scientific department is supplied with a fine cabinet of specimens illustrating geology and mineralogy. This collection was largely augumented by donations from many of the exposition commissioners.

Skeletons to illustrate the various types of vertebrates in zoology and also comparative anatomy. These include skeletons of bird, fish, tortoise, salamander, serpent and frog, as well as the human skeleton for comparative study, Also *papier mache* models, showing thorax, section of lung—lung removable,—heart, opening in sections showing position of valves and cavities. Models showing brain in section, and spinal cord with pairs of branches. A collection of 102 species of marine invertebrates has also been added from the Smithsonian Institute at Washington, and many species of our animals, birds and reptiles have been added within a year. This department has also fine microscopes for class work and research, imported from the well-known makers, Beck & Beck, of London, England.

The mathematical department is supplied with a good engineer's transit; a Wye level (15 inch), rod, chain, etc., for practical field work in surveying and engineering. Also, a fine water meter, presented to this department this season by the Equitable Water Meter Company, Boston; as well as a "Colorado Meter," devised and used by our State Engineer in his public work.

LOCATION.

Fort Collins, the site of the college, is a fine town of about 3,000 inhabitants, and the county seat of Larimer county.

It is situated in the beautiful and fertile valley of the Cache-la-Poudre river, just after it emerges from the foothills which skirt the snowy range. Extended views of the foothills and the ranges greet the eye, stretching away to the north and south, and culminating in Long's Peak, with its twin points, which seem like sentinels to guard this portion of the range. In other directions stretch away before you field on field of growing grain and gardens of fruits and vegetables. For healthfulness, the location cannot be surpassed. There are fewer and less disastrous storms and sudden changes than at at any other point on the slope.

The town is having a thriving and steady growth, is well governed and orderly, and has taken an advanced position in regard to education and other matters of public import.

The college is situated at the south side of town on gently rising ground. It is connected with the city system of water works, by which good pure water is furnished for all purposes. The various buildings are located on either side of the Colorado Central railroad, and fronting on College avenue, one of the fine residence avenues of the city.

The town is easily accessable from all parts of the State by means of the Colorado Central and the Greeley, Salt Lake & Pacific Railroads, by which three passenger trains arrive and depart daily for Denver and intermediate points.

HISTORY.

The State Agricultural College of Colorado, in common with those of her older sister States, had its origin in an Act of Congress, passed July 2, 1862, which granted ninety thousand acres of land as an endowment fund for a college "where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, * * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

No benefit has as yet been received from this grant, but an Act of Congress, passed April 24, 1884, will soon give some revenue from this endowment.

The State has very generously supported the college by the passage of an act levying a tax of one-fifth mill annually on each dollar of valuation. This gives the college a steady endowment but not the means for much growth. It is to be hoped that future legislation will give necessary buildings and apparatus.

To the State Board of Agriculture, organized soon after Colorado became a State, was intrusted the work of building a college and caring for the same. The town of Fort Collins was selected as its site, and at a meeting, held February 27, 1878, it was determined to erect a building suited to college purposes. The corner stone was laid July 29, 1878, and in the same year the building was completed. The college was not opened for the reception of students until September 1, 1879. The dormitory was erected in 1881, and the chemical laboratory in 1882, but not thoroughly fitted for work until May 1883. A small propagating house was built in 1882, for the purpose of aiding Horticulture. The present greenhouse, with its curvilinear roof and all modern appliances, completed September 1, 1883, is a long step in advance. On the same day the fine mechanic shop was completed, its machinery in order and ready to run.

The college now comprises the following distinct departments, viz: Agriculture, Horticulture and Botany, Physics and Irrigation Engineering, Chemistry, Mathematics, Mechanics and Drawing, Veterinary Science and Zoology, and English, History and Modern Languages.

EXPERIMENTS

From the organization of the college, experiments have been planned and carried on, but mostly with cereals and grasses. These are being continued by the Agricultural department. The farm will be cultivated to some extent experimentally, but the greater part will be performed upon the selected and platted experimental ground.

The Horticultural department is experimenting with many varieties of small fruits, in pomology, and forestry, having obtained much new stock, some directly from stock obtained of Professor Budd, of Iowa, in Russia. Experiments in garden culture and products are being made, in cross-fertilization of some varieties to note results, and in testing the vitality of seeds.

The department of Chemistry is carrying on the observations in meteorology, and also a series of observations on soil temperatures, to further work and facts in Agricultural Chemistry.

The Engineering department is planning to make experiments in flow and application of water, to assist in answering some of the vexing questions in irrigation.

CALENDAR.

1886-87.

SEPTEMBER.

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OCTOBER.

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NOVEMBER.

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DECEMBER.

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JANUARY.

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FEBRUARY.

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MARCH.

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APRIL.

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MAY.

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...	...	...	...	...	...	..

JUNE.

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19	20	21	22	23	24	25
26	27	28	29	30	...	...
...	...	...	...	...	...	...

LIST OF GRADUATES.

Name.	Avocation.	Address.
Libbie Coy,	At Home, (Former Instructor Agr'l College,)	Fort Collins, Colo.
Leonidas Loomis,	Cattle Raising,	Green River City, Wyo.
George H. Glover, D. V. M.,	Veterinary Surgeon,	Longmont, Colo.
Cora B. Blinn,	Teacher,	Berthoud, Colo.
Edna Hice,	Teacher,	Fort Collins, Colo.
Lelia Loomis,	At Home,	Fort Collins, Colo.
Grace Patton,	Teacher, (Instructor Agr'l College,)	Fort Collins, Colo.
Robert E. Trimble,	Cattle Raising,	Near Fort Collins, Colo.
Wilbert J. Sickman,	Merchant,	Fort Collins, Colo.

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REGISTER

OF THE

OFFICERS AND STUDENTS

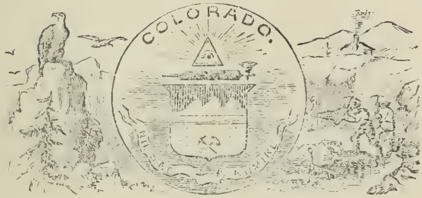
AND

Courses of Instruction

IN THE

STATE AGRICULTURAL COLLEGE.

FORT COLLINS, COLO.



1886-87.

FORT COLLINS, COLO:
Larimer Bee Publishing House,
1887.

MEMBERS

OF THE

State Board of Agriculture.

	Term Expires.
HON. FRANK J. ANNIS, Fort Collins	1895
HON. CHARLES H. SMALL, Pueblo	1895
HON. R. A. SOUTHWORTH, Denver	1893
HON. G. E. WYMAN, Longmont	1893
HON. B. S. LaGRANGE, Greeley	1891
HON. W. F. WATROUS, Fort Collins	1891
HON. JOHN J. RYAN, Loveland	1889
*HON. ROBERT C. NESBIT, Del Norte	1889
HIS EXCELLENCY, GOV. ALVA ADAMS, PRESIDENT CHARLES L. INGERSOLL,	*Ex-Officio.*

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*To fill vacancy caused by death of Maj. Henry Foote, Del Norte, Colo.

30830

OFFICERS OF THE STATE BOARD.

HON. G. E. WYMAN	President.
HON. F. J. ANNIS	Secretary.
HON. PETER W. BREENE, *(Ex-Officio)*	Treasurer.

COMMITTEES.

COLLEGE BUILDINGS.

B. S. LaGrange, C. H. Small, W. F. Watrous.

EXPERIMENT STATIONS AND SCIENTIFIC EXPERIMENTS.

F. J. Annis, C. L. Ingersoll, R. A. Southworth.

FARM.

B. S. LaGrange, R. A. Southworth, J. J. Ryan.

FINANCE.

J. J. Ryan, W. F. Watrous, C. H. Small.

FACULTY, TEXT BOOKS AND COURSE OF STUDY.

F. J. Annis, R. A. Southworth, B. S. LaGrange.

HORTICULTURE.

W. F. Watrous, R. C. Nesbit, F. J. Annis.

MATHEMATICS AND ENGINEERING.

R. C. Nesbit, B. S. LaGrange, R. A. Southworth.

MECHANICS AND CHEMISTRY.

C. H. Small, F. J. Annis, W. F. Watrous.

VETERINARY SCIENCE AND STOCK.

R. A. Southworth, R. C. Nesbit, J. J. Ryan.

*FACULTY OF INSTRUCTION.

CHARLES L. INGERSOLL, M. S.,
President, Professor of Political Economy and Logic.

AINSWORTH E. BLOUNT, A. B.,
Professor of Agriculture, Superintendent of Farm.

JAMES CASSIDY,
Professor of Botany and Horticulture, Superintendent of Department.

JAMES W. LAWRENCE,
Professor of Mechanics and Drawing.

MAJOR VASA E. STOLBRAND,
Professor of Mathematics and Military Science.

ELWOOD MEAD, B. S., C. E.,
Professor of Physics and Engineering.

†CHARLES A. CRAMPTON, B. S., A. C., M. D.,
Professor of Chemistry and Geology.

MAUD BELL,
Professor of History, Literature and Modern Language.

——————— ———————
Professor of Veterinary Science.

GRACE PATTON, B. S.,
Instructor in College and Preparatory Department.
Since January 1, 1887, Acting Professor of Chemistry.

HON. F. J. ANNIS, (*Ex-Officio*),
Secretary of Faculty.

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*The following changes have been made during the College year: September 1, 1886, Prof. C. F. Davis resigned the Chair of Chemistry; December 0, 1886, the Chair of Veterinary Science was declared vacant; April 9, 1887, Miss E. G. Bell resigned the Chair of History, Literature and Modern Language, on account of ill health.

†To commence September 1, 1887.

REGISTER OF STUDENTS.

Barron, Robert W.,	*Laramie City,*	*Wyo. Ter.*
Bell, Lucy,	*Chester,*	*N. H.*
Benson, Clarence V.,	Loveland,	Colo.
Benson, Vellie V.,	“	“
Botsford, Willie N.,	Fort Collins,	“
Bourse, Fanny A.	“	“
Boyd, Psyche E.,	Greeley,	“
Bristol, Bertha M.,	Fort Collins,	“
Brown, Clarence R.,	“	“
Brush, Melvina E.,	Hillsborough,	“
Brush, Wesley L.,	“	“
Buffum, Bert C.,	Fort Collins,	“
Burns, Alana C.,	“	“
Calkins, John S.,	Semper,	“
Calkins, Henry A.,	“	“
Carpenter, Don A.,	Timnath,	“
Carpenter, Faith,	*Papillion,*	*Neb.*
Coffin, Lewis A.,	Longmont,	Colo.
Coffin, Gertrude,	“	“
Conroy, Ernest A.,	Fort Collins,	“
Coy, Fanny E.,	“	“
Davis, Arthur L.,	Arvada,	“
Davis, Cora B.,	Fort Collins,	“
DeVotie, Frank D.,	Greeley,	“
Driscoll, William M.,	Dolores,	“

Duncan, Charles A.,	Timnath,	Colo.
Dye, Horace B.,	Rocky Ford,	“
Elton, Carrie I.,	Fort Collins,	“
Ernest, Carrie L.,	“	“
Faville, M. C.,	Denver,	“
Furniss, Edward C.,	Hillside,	“
Galbraith, Sam V.,	Fort Collins,	“
Garbutt, Newton C.,	LaPorte,	“
Gard, William H.,	Hillsborough,	“
Gilkison, Charles J.,	LaPorte,	“
Gill, Eleanor F.,	Fort Collins,	“
Golding-Dwyre, Effie,	“	“
Greenacre, Harold,	“	“
Griffin, Harvey H.,	Island Station,	“
Griffin, George M.,	“	“
Handy, George H.,	Fort Collins,	“
Harrington, Mattie,	Rocky Ford,	“
Hartley, Randolph S.,	Manitou,	“
Hazzard, Albert G.,	Island Station,	“
Hice, Lida,	Fort Collins,	“
Ingersoll, Frances E.,	“	“
Inglefield, Maud J.,	“	“
Johnson, F. Lee,	Estes Park,	“
Kane, W. Frances,	Loveland,	“
Kelly, Ben,	*Cheyenne,*	*Wyo. Ter.*
Kelly, Kate,	“	“
Kinnison, H. J.,	Denver,	Colo.
Lee, Josephine,	Fort Collins,	“
Lee, Kate E.,	“	“
Lynn, Leonard,	*Wetmore,*	*Kan.*
Maxwell, Lulu,	*Cheyenne,*	*Wyo. Ter.*
McClelland, Henri S.,	Fort Collins,	Colo.

McClelland, J. Horace,	Fort Collins,	Colo.
McLain, Don. C.,	Timnath,	“
McLain, Genevieve E.,	“	“
McMillian, John,	Denver,	“
Mead, Florence E.,	Fort Collins,	“
Moor, Ellsworth,	*Sardinia,*	*Ind.*
Mulvihill, Frank E.,	Denver,	Colo.
Nettleton, Edwin G.,	“	“
Nightengale, George E.,	*Alexander,*	*Neb.*
Patton, Grace, B. S.,	Fort Collins,	Colo.
Peabody, Jr., David G.,	Canon City,	“
Pease, Augustus,	Fairplay,	“
Pennoyer, Mary A.,	Pinewood,	“
Peterman, Dora E.,	Fort Collins,	“
Plumb, Antoinette M.,	Erie,	“
Post, Lillian E.,	Fort Collins,	“
Ramer, John,	“	“
Ramsey, William A.,	Denver,	“
Reavill, Rosa A.,	Fort Collins,	“
Rogers, Frank H.,	Golden,	“
Russell, Platte A.,	Rocky Ford,	“
Sanderson, Gertrude,	Berthoud,	“
Scribner,, Harold F.,	Fort Collins,	“
Silcott, Lillie M.,	“	“
Simon Sara,	Dolores,	“
Skelley, William R.,	Trinidad,	“
Southworth, L. Maude,	Denver,	“
Southworth, May,	“	“
Stratton, Daisy E.,	Fort Collins,	“
Stratton, Lerah G.,	“	“
Stratton, Sophy,	“	“
Sturdevant, Arthur,	“	“

Suiter, Charles,	Fort Collins,	Colo.
Suiter, Edward F.,	“	“
Temple, Frank L.,	*Chico Springs,*	*N. M.*
Temple, Harry R.,	“	“
Thomas, Harlan,	Fort Collins,	Colo.
Thomas, Warren,	“	“
Tyler, Dolph,	Boulder,	“
Vail, Edward,	Fort Collins,	“
Vandewark, Floyd C.,	“	“
Wallace, John U.,	LaPorte,	“
Weeks, Ernest A.,	Fort Collins,	“
Wells, Marcus E.,	Castle Rock,	“
Wilkin, Clara A.,	Fort Collins,	“
Willard, W. W.,	Granite,	“
Williams, Harry F,,	Greenland,	“
Woods, George D.,	Fort Collins,	“

RECAPITULATION.

Male Students	63
Female Students	42
Total	105

POSTOFFICES REPRESENTED.

STATES.	
Colorado	23
Wyoming Territory	2
New Mexico Territory	1
Nebraska	1
Kansas	1
Indiana	1
New Hampshire	1
Total	30

COLORADO BY COUNTIES.

	POSTOFFICES.
Larimer	6
Weld	3
Boulder	2
Jefferson	3
Arapahoe	2
Douglas	2
Park	1
Fremont	1
El Paso	1
Bent	1
Las Animas	1
Total	23

GRADUATES.

1884.

Libbie Coy, B. S., Fort Collins, Colo....................Teacher
Leonidas Loomis, B. S., Green River City, Wyo. Ter'y...Stockman
George H. Glover, B. S., D. V. M., Longmont, Colo............ Practicing his profession

1885.

Cora B. Blinn, B. S., Berthoud, Colo...................Teacher
Edna Hice, B. S., Fort Collins, Colo....................Teacher
Lelia Loomis, B. S., Fort Collins, Colo.................At home
Grace Patton, B. S., Fort Collins, Colo......................... Assistant Chemical Department Agricultural College
Robert E. Trimble, B. S., Fort Collins, Colo.................... Stockman and Farmer
Helen White, B. S., Fort Collins, Colo.................At home

1886.

Wilbert J. Sickman, B. S., Fort Collins, Colo..........Merchant

1887.

Eleanor F. Gill, B. S.........................Fort Collins, Colo.
Daisy E. Stratton, B. S......................Fort Collins, Colo.
Lerah G. Stratton, B. S......................Fort Collins, Colo.
Edwin G. Nettleton, B. S.........................Denver, Colo.

Total, 14.

COLLEGE CADETS.

OFFICERS.

Captain—Griffin, H. H.

First Lieutenant—Garbutt, N. C.

Second Lieutenant—Davis, A. L.

SERGEANTS.

McClelland, J. H.
Ramsey, W. A.
Dye, H. B.
Griffin, G. M.
Hazzard, A. G.
McClelland, H. S.

CORPORALS.

Buffum, B. C.
Temple, H. R.
Thomas, W.
Wallace, J. U.

PRIVATES.

Barron,
Benson,
Brown,
Brush,
Calkins, J. S.
Calkins, H. A.
Carpenter,
Conroy,
DeVotie,
Duncan,
Furniss,
Galbraith,
Gard,
Gilkison,
Greenacre,
Hartley,
Johnson,
Kane,
Kelly,
Kinnison,
Lynn,
McLain,
Mulvihill,
McMillian,
Moor,
Nightengale,
Peabody,
Pease,
Ramer,
Russell,
Scribner,
Skelley,
Sturdevant,
Suiter, C.
Suiter, E. F.
Temple, F. L.
Thomas, H.
Tyler,
Vail,
Weeks,
Wells,
Willard,
Williams,
Woods.

COURSE OF STUDY AND LABOR.

PREPARATORY YEAR.

FIRST TERM.

Arithmetic	Sanford's Analytical
Physical Geography	Houston
English Analysis	Kellogg

Labor, two hours, farm or garden.

SECOND TERM.

Arithmetic	Sanford's Analytical
English Analysis, half term	Kellogg
U. S. History, half term,	Johnston
Word Analysis	Swinton

Labor, two hours, shop practice.

THIRD TERM.

Algebra	Olney
U. S. History	Johnston
Elocution	Fenno

Labor, two hours, farm or garden.

Military Drill, four exercises a week.

Penmanship, one exercise a week, at same hour.

FRESHMAN YEAR.

FIRST TERM.

Algebra	Olney
Ancient History	Swinton
Book Keeping	Meservey

Labor, two hours, farm or garden.

SECOND TERM.

Algebra	Olney
Ancient History, half term,	Swinton
English Literature, half term,	Shaw
Botany	Gray, with Coulter's Flora

Labor, two hours, shop practice.

THIRD TERM.

Geometry	Wentworth
English Literature	Shaw
Botany	Gray, with Coulter's Flora

Labor, two hours, farm or garden.

Military Drill, four exercises a week.

Composition, one exercise a week, at same hour.

SOPHOMORE YEAR.

FIRST TERM.

Geometry	Wentworth
Chemistry	Lectures
Drawing	Lectures and practice

Labor, two hours, Chemical Laboratory practice.

SECOND TERM.

Trigonometry	Wentworth
Chemistry, Organic, half term,	Lectures
Physiology, half term,	Martin
Drawing	Lectures and practice

Labor, two hours, shop practice.

THIRD TERM.

Surveying	Bellows and Hodgeman
Physiology	Martin
Drawing	Lectures and practice

Labor, two hours, field surveys, etc.

Military Drill, four exercises a week.

U. S. Constitution and government, one lesson a week, at same hour.

N. B.—From this point the course has two required lines of study and labor, and an opportunity to elect between—Irrigation Engineering, Mechanics and Drawing, or Language, for the third line. The required studies in each case are named first.

JUNIOR YEAR.

FIRST TERM.

Physics	Kimball's Olmstead
Zoology	Packard
Electives.	
Hydraulics	Fanning
Drawing	Architectural and Machine
German	Otto's Grammar

SECOND TERM.

Physics	Lectures
Geology	Le Conte
Electives.	
Agricultural Chemistry	Lectures
Drawing	Architectural and Machine
German	Otto's Grammar

THIRD TERM.

Physics	Lectures
Agriculture, or Entomology,	Lectures
Electives.	
Reservoirs	Lectures
Drawing	Architectural and Machine
German	Readings and Otto

Labor, two hours daily, through the year, in Field work in Engineering, Shop, Chemical Laboratory, or upon Farm or Garden; the election to be in consonance with the course of study selected.

SENIOR YEAR.

FIRST TERM.

Psychology	Hopkins and Lectures
Agriculture	Lectures
Landscape Gardening, or	Kemp
French	Otto's Grammar

Electives.

Canal Work, Steam Engine, Structure, Etc., Veterinary Science,	Lectures
German	Conversation and Translation

SECOND TERM.

Logic	Fowler
Horticulture, or	Lectures
French	Otto's Grammar

Electives.

Irrigation Law, Power, Transmission of, Etc.,	Lectures
Veterinary Science	Law
German	Conversation and Translation

THIRD TERM.

Political Economy	Wayland-Chapin
Floriculture, Entomology, Etc.,	Lectures
French	Otto's Reader

Electives.

Astronomy	Lockyer
Special Machines, Etc	Lectures
Veterinary Science	Law and Lectures
German	Conversation and Translation

Labor, two hours, three exercises a week, in consonance with course selected. Two exercises a week in Microscopy, through the year, with Thesis at the close, for all except those students who elect the course in Mechanics and Drawing; these have five exercises a week in shop.

DEPARTMENTS

OF

Instruction and Labor.

AGRICULTURE.

The study is pursued by a course of lectures in the third term of the junior year, in which are discussed the various breeds of horses cattle, sheep, swine and poultry; their peculiarities, history, adaptation, etc., etc.; cereals, preparation of soil, seeding, harvesting, threshing, marketing; laying out a farm, improvements; farm and public roads, bridges, culverts; location and erection of buildings.

In the senior year, the student is given more instruction in this line, after he has pursued thoroughly those branches of science which underlie or are closely related to agriculture.

Farm yard manures, their application and utility; irrigation and its application; dairy husbandry; farm accounts; rotation of crops; drainage; farm implements; improvement of cereals by selection, crossing and care; and the careful employment and superintendence of labor.

Students labor upon the farm and experimental ground two hours daily school day. "Labor and study, theory and practice go hand in hand. To know how and when to do work well is a science; to acquire the skill is an art. That they may obtain the science, study is necessary; to get the art, work is indispensable."

BOTANY.

The instruction in botany is very full and complete, commencing with the study of vegetable physiology and proceeding to structural and systematic botany. After a thorough study of principles, the students are required to study the plants, and in this way to fix in their minds the principles before so thoroughly scanned. Two terms of the freshman year are devoted to the foregoing work. The new green house, completed September 1, 1883, furnishes ample material for work, and, distributed over a large number of botanical families, our facilities for instruction in this branch are unsurpassed. In the senior year, the students take up the work of microscopy, in which the study of histology is pursued. Many plants and organs are examined by section, and the student required to make drawings and permanent mountings of the same. In this manner, the students become prepared to make independent investigations in various directions, in after life.

CHEMISTRY.

It is the object of this department to give the student an opportunity to acquire a thorough mastery of the elementary principles of the chemical science. To attain this object, the theory and practice are made to go hand in hand. In the first term of the sophomore year, the class listens to a series of lectures upon the general theory of the science, its history and development. In this course of lectures are discussed the subjects of acids, bases and salts, and the principles of the chemical philosophy. The nature, history and compounds of each of the elements are discussed in detail, the whole being enforced by numerous experiments. While taking this course, the student spends two hours each day in the work-room, repeating the experiments shown in class, and others which may be suggested, and prepares a series of substances by the synthetic process. This labor serves to familiarize the student with various forms of crystals, the marked distinction between various classes of salts, the use of the nomenclatures, and the manipulation of apparatus.

In the second term of the sophomore year, there is given a course of lectures on Organic Chemistry, continuing for six weeks, one hour daily.

In the second term of the junior year, the student listens to a course of lectures upon Agricultural Chemistry, in which are discussed such subjects as the following: Relation of chemistry to agriculture, the literature of Agricultural Chemistry; elements of plant growth, their relative abundance and importance; the atmosphere, the soil, fertilizers, etc.

During this term the class spends two hours daily in the work-room, where the students pursue the study of qualitative analysis, by precipitation, and a short practice in volumetric analysis. Practice in the use of the blow-pipe accompanies this work, and an insight into determinative mineralogy is thus acquired. The student will also make a few determinations quantitatively of the relative ash of plants; the water and organic matter of plants, and at least one ultimate analysis of soil.

Keeping in mind the objects for which our college is founded, we have so planned our chemical course as to prepare the student for the general application of chemistry in its relation to the industrial arts, while seeking especially to thoroughly ground him in the application of the science to agriculture.

HORTICULTURE.

Instruction in the several branches of Horticulture is given as follows: In practical Floriculture, by lectures upon such topics as the construction, heating and management of green houses; the propagation of plants by seeds, cuttings, layers, budding and grafting; how budding and grafting are done, and their uses; the cultivation and general management of green house plants for commercial or private purposes; insects and diseases of plants under glass, with remedies therefor; parlor gardening, Wardian cases and ferneries; arrangement of flowers in bouquets and floral designs.

Instruction in Pomology is given by lectures, and embraces a theoretical and practical study of the propagation, planting, pruning and general management of orchards and small fruit gardens; insect enemies, diseases and varieties best adapted to this latitude; classification of fruits by form, habit of growth, flowers and leaves.

Vegetable Culture comprises kitchen and market gardening, and seed growing; and the principal topics considered are: The best situation for, and the laying out of, the garden with a view to its irrigation, and most economical management in the rotation and planting of crops for the family and for market; management of composts and commercial fertilizers; care of tools; selection and growing of seeds; construction, management and uses of hot-beds and cold-frames; harvesting, marketing and storing of fruits and vegetables.

Forestry is taught by lecture, special attention being given to such topics as the value of trees and shrubs for timber and ornament, for hedges, screens and shelter belts for this State; the best methods of culture, with a history of varieties, especially such as are thought worthy of trial in this latitude.

Landscape Gardening is taught in the senior year by regular study of text-book: Kemp's "How to Lay Out a Garden," and lectures, adapted as much as possible to the exigencies of this climate; frequent use being made of the grounds, and their planting, for illustration. The orchards, nursery, green house, vegetable garden and flower garden afford ample opportunity to the student to acquire a practical acquaintance with the above topics. Each student before completing the study must complete a formal plat, arranged with reference to the best principles of the art.

MATHEMATICS.

The instruction offered by this department is designed to conform to the general aim and purpose of the institution; accordingly, only those branches of pure mathematics are taught, which the student will find of greatest service in after life. The instruction in this portion of the subject being about the same as that of classical colleges, while the attention given to applied mathematics, including surveying and engineering, is much greater than that of the usual college course.

ARITHMETIC.—Students entering the preparatory year, in the first and second terms pay special attention to decimal notation and general analysis, covering the several departments of commercial arithmetic.

ALGEBRA.—The study of Algebra occupies the last term of the preparatory year, and the first and second terms of the freshman year. In the first term the principal object is to thoroughly familiarize the pupil with the use of literal quantities and the processes of factoring. The second term's work is largely devoted to the study of the equation, and its uses in the solution of intricate problems in interest, common discount and alligation, and for the demonstration of geometrical and trigonometrical theorems. The last term is given to Higher Algebra. Through this study two objects are kept prominently in view: First, to give the pupil facility in the use of algebraic processes, and second, to train him to methods of reasoning rather than operating.

Geometry is placed in the third term of the freshman year and the first term of the sophomore year. Problems in mensuration and original exercises will be added to the routine text-book work, giving the student frequent practice in the application of principles already acquired, and enabling him to fix more firmly the knowledge gained.

TRIGONOMETRY AND SURVEYING.—Trigonometry is taught during the second term of the sophomore year. This is followed in the third term by surveying; the instruction in which will be in part by lectures, and includes theory, adjustment and use of instruments, history and methods of the U. S. Government surveys. In addition to the class-room exercises, the students will be required to devote from two to three hours daily to practice in the field. They will take their own notes, from which they will be required to submit computations, accompanied by drawings made to scale.

MILITARY SCIENCE.

The instruction offered by this department, created at the annual meeting of the Board of Agriculture, held in 1884, and filled by the election of a lieutenant of the regular army, is intended to conform not only to United States and State laws, but to accustom the student to habits of prompt yet not machine obedience; to foster and cultivate the ardor and the natural martial instinct so inherent in our national character; to teach him the why and wherefore of, obedience first,—questioning, if any, afterwards —(the maxim so necessary to be observed in all military operations); and to prepare him should necessity arise, to organize and drill a company or battalion of our national mainstay—the citizen soldiery.

In the Fall and Spring terms 45 minutes daily are devoted to practical application of the theory of the Infantry Tactics as expounded and illustrated in the class room in the winter term. These daily drills assume more the character of a recreation than a task.

The uniform, which will be required of each male student next year, is modeled somewhat after the fatigue uniform of the regular army; it is neat and comprises coat, pants, cap and gloves, and is substantial but not costly.

Military drill is required of each male student for three years unless excused for physical disability or by special vote of the faculty for special satisfactory reasons.

PRACTICAL MECHANICS.

The old system of apprenticeship is rapidly becoming a thing of the past, and it is now almost impossible for a boy to learn a trade in any modern shop or factory. This is owing, largely, to the introduction of special machinery, necessitating special workmen to manage it, and the workman who has learned to run a machine of this kind is kept at that work, as being most profitable to his employer; his practical knowledge of other methods and machines is, therefore, confined to narrow limits, and, should a vacancy occur in a superior position, he is not the man for the place, from the fact of his being unacquainted with other practical parts connected with his trade, the manipulations and principles involved in which he has not had an opportunity to learn.

This department has for its object a systematic and progressive education in the use of tools and materials, combined with as much theoretical knowledge as shall be deemed necessary to properly explain the principles involved. It does not teach special trades, nor manufacture salable articles; to do so would require that the student be kept on the kind of work he could do best, and thus prevent him from acquiring broad and liberal ideas of other methods. So, without teaching any one complete trade, the mechanical principles of many are gained. This does not necessarily mean that the student becomes sufficiently expert to compete with the skilled mechanic, but that a knowledge of *how* a tool or machine should be used, and the manner of *laying out work* for the same is thoroughly taught.

Although it is not expected that all students are to become mechanics, yet such a training cannot but make its salutary effects felt in whatever walk of life he may be chosen.

Should his surroundings be such that he enters manufacturing, his ideas having been broadened by this training, the student will the more readily grasp anything new that may come up in his business, or, if he take up farming, he will, with greater ease, be able to understand the mechanical principles and workings of his machinery, and also how to keep them and his buildings in proper repair.

The shop instruction will be divided in courses as follows, and in each course will be given, in connection with the work, an explanation of the construction of each tool, its manner of acting on the material, and methods of determining how to select materials best suited to different kinds of work, and manner of laying out work, cutting speed tools, etc.

COURSE OF LABOR.

First Year.

Bench work in wood	14	weeks
Machine work in wood	4	“
Pattern making	12	“
Vise work in iron	10	“

Second Year.

Iron forging	14	weeks
Steel forging	4	"
Machine work in iron	20	"

Bench Work in Wood. This course will consist of exercises with the different wood working bench tools, so arranged in a graded series as to embrace the manipulation of the tools in their various applications.

First—The use of planes in joining, smoothing and getting the piece out of wind, lining off, and the use of the saws in cutting across and with the grain and keeping to line.

Second—Halved splice.

Third—Splayed splice.

Fourth—Keyed splice.

Fifth—Open devotail mortise and tenon joint.

Sixth—Mortise and tenon joint.

Seventh—Open dovetail joint.

Eighth—Blind dovetail joint.

Ninth—Lap joint.

Tenth—Dowel joint.

Eleventh—Small newel post with hand-worked rail.

Twelfth—Panel door.

Thirteenth—Roof truss.

Fourteenth—Box.

Fifteenth—Carpenter's trestle.

Machine Work in Wood.—In connection with this course, with the use of tools, will be given the most rapid and economical method of selecting and preparing the wood for the machine. There will be given examples of

First—Straight turning.

Second—Cutting-in and squaring-off.

Third—Convex, concave and compound curves.

Fourth—Handles for chisels and other tools.

Fifth—Examples in chuck-work in separate and combined pieces.

Sixth—How to turn a ball.

PATTERN MAKING AND FOUNDRY WORK.—After becoming familiar with bench and machine work in wood, an applicatlon of both is made, by constructing patterns with due regard to shrinkage, draft and the best method of constructing the pattern, so that it causes the least amount of trouble in the foundry. There will be given examples of

Plain work.
Core work.
Pully work.
Pipe work.
Gear work.
Core boxes, their uses and construction.

And in the foundry will be given practice in moulding in plain and core work.

VISE WORK IN IRON.—With this course will be given an explanation of the different kinds of tools and their effect on the material, and the style of tool to be selected for certain kinds of work. There will be given examples in

Chipping cast iron, wrought iron and steel.
Spline chipping.
Hack sawing.
Filing square and round surfaces to line.
Shoulder, point and other free hand filing.
Fitting joints.
Finishing and scraping.

FORGING IN IRON AND STEEL.—Care of the fire.

The effect of different heats on the material.

Drawing, upsetting, bending.

Scarf, fork, jump and other styles of welding.

Welding iron to iron. iron to steel, steel to steel.

Rings, chains, ring bolts, brackets. braces, heading-tools, nails, bolts, hooks, hasps, swivels, tongs, cattle brands.

Steel wrenches, cold chisels, drills, lathe tools, springs, etc., etc.

Examples in tempering and case-hardening.

MACHINE WORK IN IRON.—Care of the machines, their construction, proportion and use of the different parts.

Cutting speed of tools, and proper angle of cutting edge for different purposes and different metals.

Centering and straightening work.

Straight turning and squaring.

Boring.

Making and fitting joints.

Chuck-work.

Screw-cutting inside and outside.

Drilling, tapping and reaming.

Boring with boring-bar and use of center rest.

Polishing and finishing.

Hand-tool work.

DRAWING.

FIRST YEAR.

Geometrical problems.

Free-hand copy and dictation.

Designs.

Linear perspective.

Model and object drawing.

SECOND YEAR.

Orthographic and Isometric projections, and projection of shadows.

Development and intersection of surface.

Light and shade.

Historical ornament.

Wood carving, diaper, incised and relief.

Persons having parts of machines, patterns, small models, or working drawings, may, if they choose to donate the same to the department, confer a great favor upon the college, and especially upon the department.

PHYSICS.

The study of Mechanical and Chemical Physics will continue for three terms. The first term will be devoted to the study from text-book of the mechanics of solids. The second term will be given to the subjects of Hydrostatics, Pneumatics, Acoustics and Optics, by lecture. In the last term will be given the subjects of Heat, Electricity and Magnetism, from the standpoint of Chemical Physics. The whole study of Physics will be illustrated, where practicable, by apparatus and experiment.

IRRIGATION ENGINEERING.

The instruction in this department is designed to acquaint the student with the theoretical and practical features of Irrigation as applied to the agriculture of the arid region.

The course of study continues throughout the Junior year and the winter term of the Senior year, and is as follows: During the fall term of the Junior year the students pursue a very thorough course in the theory and practice of water measurement, which includes the pressure of water in pipes and reservoirs; its flow in pipes, open channels and over weirs, and the discharge through different forms of orifices. Practical experiments are made in measuring the flow through canals, and the merits and defects of the different forms of measuring devices now in use are carefully studied, the work of the term ending with a series of lectures on the "duty of water," and on the location, cost and management of pumping stations.

In the winter term the subject of reservoirs is considered. This embraces a course of lectures upon the considerations affecting the location of reservoir sites; the designing and construction of embankment walls, discharge gates, etc. In connection with the class room instruction, the students are required to make surveys of reservoir sites and prepare plans and drawings of embankments and discharge gates, accompanied by estimates of the capacity and cost.

Canal construction is studied in the spring term and includes the surveys and estimates of cost of construction of canals and laterals, the construction of flumes and headgates, etc., the year's work being designed to give the student a knowledge of the engineering and agricultural principles, which underlie the measurement and distribution of water.

In the Senior year a course of lectures is given on irrigation history and practice. It includes a description and analysis of the laws and practices of our own State, and a history and description of some of the most progressive irrigation districts of Europe.

VETERINARY SCIENCE.

The department of Veterinary Science was introduced September 1, 1884. The course of study runs through the senior year. During the first term the class is given lectures upon the anatomy and physiology of the domestic animals, taking the horse as a type, and illustrating the lectures by means of anatomical models and actual dissections by the class. During the second term the course consists of lectures upon diseases and treatment and materia medica. During the third term of the year the lectures upon diseases and treatment are concluded, and the class are given lectures upon veterinary sanitary science (the relation that diseased animals bear to the public health), and the management and care of breeding animals.

PHYSIOLOGY AND COMPARATIVE ANATOMY.

The study is begun in the second term of the sophomore year, lectures being given on Anatomy, and followed by a thorough study of Physiology. Martin's "Human Body" is used as text-book, supplemented by lectures. The course covers one-half the sophomore year.

ZOOLOGY.

This branch of study is begun in the junior year and runs through fifteen weeks. The text-book used is "Packard's Zoology," briefer course, supplemented by lectures and museum work. The museum work consists of dissections and drawings, and classification of animals. The college facilities in the way of skeletons and specimens of both marine and inland fauna are not equaled in the west, and additions are being constantly made.

ENTOMOLOGY.—This branch of Zoology is studied more completely in a course of lectures in the junior year, in which the subject of bee-keeping receives especial attention. The instruction deals largely, after the grouping and classification are disposed of, with the study of those species and genera of insects which are either beneficial or injurious to the agriculturist. In this connection are discussed the various known means and remedies of checking the ravages of those injurious. Some laboratory work will be required of each student.

MICROSCOPY.

In the senior year the student takes up the subject of Microscopy. In this work the student takes up the particular study of histology, completing the work begun in Botany, by a study of many of the fungi, and accompanying the study of Physiology and Anatomy by the microscopical study of the structure of organs. The laboratory is fitted with Beck's Economic microscopes, furnished with two eye-pieces, and one-half and one-sixth objectives, giving a magnifying power of from 60 to 800 diameters, and all the necessary apparatus for the best of scientific work. These instruments were imported from the well-known firm of R. & J. Beck, London, which is a sufficient guarantee of their quality. The object of this work is to fit the student to make independent investigations in various directions, and each student is required to work out carefully some particular topic in Biology, with careful notes, drawings and mounted specimens, which will be kept as the property of the institution. These are carefully bound and preserved in the library.

ENGLISH.

The study is begun as a review of English analysis and continued by the study of word analysis in the preparatory year. The subject is carried forward by weekly class exercises in composition during the entire freshman year.

HISTORY AND LITERATURE.

The entire freshman year is devoted these topics. The year begins with Ancient History, in which text-book and lectures intermingle in the use of the class when studying special epochs or periods. The last half of the year is devoted to English history and cotemporaneous literature, interspersed with critical readings from selected authors.

FRENCH AND GERMAN.

German is studied during the junior and senior years. French is studied during the senior year.

The great increase of the German population in America during the last thirty years has made a practical knowledge of the German language a business commodity as well as an elegant accomplishment. A course of but one year in French and two in German is not sufficient to give a mastery of either language, but the limited time of study is occupied in giving, as far as possible, power to converse in every day life. The recitations are conducted in the language studied and much stress is placed upon ability to converse as the most certain road to ability to read and use French and German.

MENTAL AND MORAL SCIENCE.

These studies are pursued in the senior year, in such a manner as to give a good outline in each, which the student is expected to fill in largely by supplementary readings. Hopkins' Outline Study of Man is used as text-book and guide.

LOGIC.

The study of this branch is considered of prime importance, as in the presentation of the inductive we find the methods pursued for the advancement of science and the means of elimination of error from experiment. The term's work is equally divided between the inductive and the deductive method.

POLITICAL ECONOMY.

Wayland, lectures and discussions, are used. The short term only gives sufficient time to arouse an interest in the divisions of the subject, and leads the student to read and act intelligently on the questions which interest us as a nation in our growth and increase of wealth.

The study of the Constitution of the United States and of the State of Colorado both conjoin to make more broad the mind of the student and the better fit him to take his place among the citizens of this or other States.

These, with other subjects relating to civics, will be given by a series of exercises continuing through the sophomore year; and thus earlier in the college course will we strive to urge thought in the direction of good citizenship.

DEGREE.

Upon those who complete the work of the course as laid down, in a good and satisfactory manner, the State Board of Agriculture, upon recommendation of the faculty of instruction, confer the degree of Bachelor of Science. A finely engraved diploma is the form of testimonial used, the fee for which and graduation is fixed at ten dollars, without other public expense to the student.

EXPENSES.

Matriculation (entrance fee, entitling the student to the privileges of full course)	$5 00
Incidental fee, per term	1 00
Board in dormitory (including room rent, heat and light), per week [about cost]	3 35
Graduation fee	10 00
Tuition	Free
Uniform	15 00@20 00

Washing averages about 75 cents per dozen; and no laundry is connected with the college. The college has dormitory accommodations for thirty young men, and cannot take all. The college has no room for young ladies; the Board of Agriculture has assigned the existing dormitory exclusively to the young men; hence young ladies seeking instruction here must find rooms and board in private families. Board can be obtained in private families at $4 to $6 a week, room rent included.

The rooms in the dormitory are each furnished with bedstead and stove; *students must furnish all else*, including straw ticks or mattresses. The conditions of occupancy are:

1. Good conduct.
2. A care and preservation of property.
3. A willing and cheerful obedience to the rules governing that part of the college.

TEXT-BOOKS.

Books should not be purchased until the student arrives at the college, and after consultation with the president of the faculty, as changes are liable to take place, or the proper edition may not be obtained.

TOTAL EXPENSES.

As some persons are desirous of knowing just what it may cost to attend school for a year, the following summary of approximate cost is made:

Matriculation fee (paid once)	$5 00
Incidentals, 3 terms	3 00
Board, 36 weeks, at $3.35 per week	120 60
Washing (average) 50 cents per week	18 00
Books (approximately)	15 00
	$161 60

The uniform is not mentioned in this estimate, as it costs no more than a good suit of citizen's clothes, and, consequently, will not increase the expense.

In terms where the students labor on farm and garden, their wages go to lessen their expenses, so that an average of $150 will pay the yearly expenses of a student during the whole course, excluding clothing, traveling expenses, and incidentals. The sophomore and junior years are a little more expensive than the others, as fees must be paid for use of chemicals and apparatus; also the terms when students work in the shop.

CHEMICAL FEES.

Sophomore year, first term	$5 00
Junior year, first and second terms	15 00
Total for chemical course	$20 00

SHOP FEE.

A shop fee of $5.00 per term is charged to cover cost of material, and breakage or damage of tools. A fee of $2.00 per term is charged for the course in wood carving.

ADVANCE PAYMENT.

All fees must be paid in advance, and a receipt obtained from the secretary entitles the bearer to admission to the classes. Board must be paid monthly in advance, and no reduction is made unless for absence of a full week at one time. In such case one-half of the time is allowed. An absence of two consecutive weeks entitles one to full reduction of time. A student leaving before the end of the term has any excess or balance to his credit refunded to him on settlement.

MONEY NEEDED BY STUDENT ON ENTRANCE.

Matriculation fee	$5 00
Incidental fee	1 00
Board (advance 4 weeks)	13 00
Room rent (about)	1 00
Uniform	18 00
Furniture for room, from $8 to $11	10 00
Books	5 00
	$44 00
Incidentals for washing, etc	6 00
	$50 00

CONDITIONS OF ADMISSION.

The college is open alike to students of either sex. Candidates for admission must be fifteen years of age, and unless personally known, must give good reference. They must also pass an examination in the common branches, viz.: Reading, Writing, Spelling, Grammar, Arithmetic and Geography. The work of the preparatory year is, in part, a thorough and practical review of Grammar and Arithmetic, with the additional subjects of U. S. History, Physical Geography, Elocution, Word Analysis and Penmanship; consequently, a candidate for admission to the freshman class must pass an examination in these branches, and not receive conditions in more than two of them. In no case can one be conditioned on the study of Arithmetic. Candidates for advanced classes or work must be examined on all previous work, or bring certificates of standing from schools having an equivalent grade of work.

REGULAR AND SPECIAL COURSES.

Unless there seem to be strong and excellent reasons for it, students will not be allowed to take a special course of study, and in case it is allowed, the student must show that he is well qualified to pursue the studies selected by passing such examinations as the faculty may assign. No student will be allowed to change his course during the progress of a term, nor will he be allowed to drop a study unless by permission of the faculty. A student cannot be allowed to leave college in term time without leave of absence granted by the president or faculty, otherwise the student will be liable to suspension or expulsion. Temporary leave of absence can be granted by the president, or the officer in charge during his absence. Final separation from college must be acted upon by the faculty.

ELECTIVE COURSES.

The adoption of the modified course of study whereby there are granted three lines of work and study in the junior year and four in the senior, will render unnecessary most of the requests for special courses. The reduction to three studies per term will also render null and void the excuse that the work is too difficult, in all ordinary cases.

LABOR.

The labor of students at the college is required by law; each student must labor two hours each school day, unless excused for physical disability. The labor at the college is of two classes: First, that which is performed for purpose of teaching the student; and second, that which is of some monetary value to the institution.

In the first class is placed all labor performed in chemical laboratory practice, in mechanic shop (work in wood or iron), and in field surveying and leveling, as well as some labor in greenhouse or conservatory. In the second class is included all labor upon the farm or garden, and extra time in mechanic shop, when the student has acquired a sufficient degree of skill. The rate paid for labor of the second class varies with the skill and fidelity of the student. The maximum price is ten cents per hour. It is believed that the students of the Agricultural College or of any industrial school are able to accomplish as much in the line of study as if no labor were performed. At the same time, the labor helps to keep the physical nature strong and healthy, while the student, by learning well the principles underlying many trades and vocations, is made strong to grapple with the duties and responsibilities of life, while being educated to take his place among the best and most honored of our citizens of the future. The time that in many colleges is spent in revelry or athletic sports, of questionable utility, is thus devoted to that which is not only a present benefit, by helping to support the student while in college, but gives him a ready means of support in many ways as soon as he leaves the college halls.

DISCIPLINE.

The discipline of the college is mild, but firm, and the faculty reserve the right to suspend pupils with or without the knowledge of the parents, according to the circumstances of the case. Good conduct and effort is expected of all; and when it becomes manifest from the deportment of any student that his presence is detrimental to the best interests of the school, either morally or otherwise, such student will be removed.

DORMITORY REGULATIONS.

Young men are expected to be at the dormitory at 7 P. M. each evening, except Sunday, when they have permission to attend church if they choose. Study hours begin at 7 P. M. and close at 10 P. M. The time for retiring is fixed at 10:15 P. M.

Any marked violation of the above regulations will be followed by warning and advice; if still persisted in, the student will be suspended from the dormitory, if not from the college. Students boarding outside must obtain permission before visiting the dormitory. Damage to rooms or property about the dormitory will be assessed to the one occupying the room, or to the whole body of domitory students if the responsible parties are unknown.

COLLEGE REGULATIONS.

Each student is expected to maintain a grade of 70, on a scale with 100 as perfect. Any student who fails to maintain this grade will be reported to the faculty by the professor in charge of such study or labor. It is then the duty of the president to announce such failure publicly before the school, after which such student shall have two weeks in which to raise his grade; at the end of this time, if such student fail to raise his grade, he shall be suspended from the school, unless sickness of the student or his friends interfere with his work, or there be some other equally extenuating circumstances, when the rule shall be inoperative.

SOCIETIES.

Two excellent literary societies have been sustained during the present year. The Æsthesian, composed of young ladies and having a nicely furnished room in which it holds its weekly meetings, and the Philalethean composed of young men who occupy the chapel for their meetings.

MEANS FOR INSTRUCTION AND ILLUSTRATION.

The college hall, with chapel, drawing room, library and reading room, museum and office of president and secretary, besides five recitation rooms, armory, society room, rooms for storage, etc.

The library of over 1,000 bound volumes, beside pamphlets, maps, magazines, papers, etc.

The chemical labratory, with lecture room for thirty-five students; also work or analytic room, with desks for twenty students, each desk being supplied with the water and gas for use of each student, and convenient hoods for ventilation.

The conservatory, 20x50 feet, with curve roof and 1.500 feet of glass, containing about 500 species or 10,000 plants, representing many interesting and rare botanical families; also, with potting room attached, and heated by improved hot water apparatus.

The orchards and grounds, carefully laid out and planted to oanamental shrubs and trees, the planting of forestry and the propagating ground of the same, the kitchen garden, with its many varieties of vegetables and small fruits, hot beds and cold frames.

The mechanic shop, consisting of main building, 25x56 feet, and two stories in height, with a rear portion, 20x62 feet, of one story. The upper floor of the main building is fitted up with benches for sixteen students in wood work; desks and tools for ten students in wood carving, and four wood-turning lathes, also a scroll saw and an iron-frame buzz saw, manufactured by Witherby, Rugg & Richardson, and complete in the range of work it can be made to accomplish. The lower floor contains an iron-working room, with sixteen benches for working in filing, etc.; a speed lathe, a very complete George L. Cady iron lathe, with attachments, and two drills for wide range of wosk; also an office and a wash-room, besides a wide hall containing the twelve-horse power engine, and from which rise the stairs to the floor above. The rear portion contains boiler and coal room, forge shop, with six forges furnished with blast from a fine Sturdevant rotary blower, a present from the manufacturers in Boston, and a foundry room, not yet fitted for work. The machinery and appliances throughout are first-class in every respect. A No. 1½ steam pump has been donated to the department by the Geo. F. Blake Manufacturing Company, of Boston, Mass.

The farm of 240 acres, with a large part under cultivation, including the experimental ground of eight acres, containing twenty-five series of plats of seventeen in each series, each plat containing two square rods. The whole ground is surrounded and the plats divided by convenient drives and walks. In stock we have Jersey cattle, Clyesdale horses and Berkshire swine; also Italian bees.

Connected with the department of Physics, we have a fine water meter, presented to this department by the Equitable Water Meter Company, Boston; as well as a "Colorado Meter," devised and used by our State Engineer in his public work; a full set of meteorological instruments, by which observations are taken three times daily, and regular monthly reports are made out and transmitted to Washington, D. C.; also, the full set of standard weights and measures recently prepared for each of the Agricultural colleges of the United States, according to joint resolution of Congress to that effect; besides these we have apparatus for illustrating lectures on the various branches of the subject.

The military department is supplied by the State with sixty stand of arms and accoutrements for practice in military drill.

The scientific department is supplied with a fine cabinet of specimens illustrating botany, entomology, geology and mineralogy.

Skeletons to illustrate the various types of vertebrates in zoology and also comparative anatomy. These include skeletons of bird, fish, tortoise, salamander, serpent and frog, as well as the human skeleton for comparative study. Also *papier mache* models, illustrating various parts of the human body and its organs. A collection of 102 species of marine invertebrates has also been added from the Smithsonian Institute at Washington, and many species of our animals, birds and reptiles have been added within a year. This department has also fine microscopes for class work and research, imported from the well-known makers, Beck & Beck, of London, England, and others of excellent make for botanical work.

The mathematical department is supplied with a good engineer's transit; a Wye level (15 inch), rods, chains, etc., for practical field work in surveying and engineering.

LOCATION.

Fort Collins, the site of the college, is a fine town of about 3,000 inhabitants, and the county seat of Larimer county.

It is situated in the beautiful and fertile valley of the Cache-la-Poudre river, just after it emerges from the foot-hills which skirt the snowy range. Extended views of the foothills and the ranges greet the eye, stretching away to the north and south, and culminating in Long's Peak, with its twin points, which seem like sentinels to guard this portion of the range. In other directions stretch away before you field on field of growing grain and gardens of fruits and vegetables. For healthfulness, the location cannot be surpassed. There are fewer and less disastrous storms and sudden changes than at any other point on the slope.

The town is having a thriving and steady growth, is well governed and orderly, and has taken an advanced position in regard to education and other matters of public import.

The college is situated at the south side of town on gently rising ground. It is connected with the city system of water works, by which good, pure water is furnished for all purposes. The various buildings are located on either side of the Colorado Central railroad, and fronting on College avenue, one of the fine residence avenues of the city.

The town is easily accessible from all parts of the State by means of the Colorado Central and the Greeley, Salt Lake & Pacific railroads, by which three passenger trains arrive and depart daily for Denver and intermediate points.

HISTORY.

The State Agricultural College of Colorado, in common with those of her older sister States, had its origin in an Act of Congress, passed July 2, 1862, which granted ninety thousand acres of land as an endowment fund for a college "where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, * * * in order to promote the *liberal* and *practical* education of the industrial classes in the *several pursuits* and *professions* of life."

No benefit has as yet been received from this grant, but an Act of Congress, passed April 24, 1884, confirmed it to the State. The land is now located and a very small portion sold, the proceeds to form a perpetual endownment fund.

The State has very generously supported the college by the passage of an act (1883) levying a tax of one-fifth mill annually on each dollar of valuation. This gives the college a steady endowment but not the means for much growth. It is to be hoped that future legislation will give necessary buildings and aapparatus.

The college was incorporated by the act of 1870 and the act amended in 1872 and again in 1874. but no steps were taken toward the erection of a college, by the board in charge. In 1877 an emergency was said to exist, caused by death of president of the board and removal of other members from the State, so that a quorum could not be convened, hence an emergency was declared to exist and the new law passed was given immediate effect. To the State board of agriculture as thus organized was entrusted the work of building a college and caring for the same.

The town of Fort Collins was selected as its site, and at a meeting, held February 27, 1878, it was determined to erect a building suited to college purposes. The corner stone was laid July 29, 1878, and in the same year the building was completed. The college was not opened for the reception of students until September 1, 1879. The dormitory was erected in 1881, and the chemical laboratory in 1882, but not thoroughly fitted for work until May, 1883. A small propagating house was built in 1882, for the purpose of aiding Horticulture. The present greenhouse, with its curvilinear roof and all modern appliances, completed September 1, 1883, is a long step in advance. On the same day the fine mechanic shop was completed, its machinery in order and ready to run.

The college now comprises the following distinct departments, viz.: Agriculture; Chemistry and Geology; Horticulture, Botany and Entomology; History, Literature and Modern Language; Mathematics and Military Science; Mechanics and Drawing; Physics and Engineering; and Veterinary Science and Zoology.

EXPERIMENTS.

From the organization of the college, experiments have been planned and carried on, but mostly with cereals and grasses. These are being continued by the Agricultural department. The farm will be cultivated to some extent experimentally, but the greater part of the experimental work in this department is performed upon the selected and platted experimental ground.

The Horticultural department is experimenting with many varieties of small fruits, in pomology, and forestry, having obtained much new stock, some directly from stock obtained by Professor Budd, of Iowa. in Russia, as well as finely grown stock from other sources. Experiments in garden culture and products are being made, in cross-fertilization of some varieties to note results, and in testing the vitality of seeds.

The Engineering department is planning to make experiments in flow and application of water, to assist in answering some of the vexing questions in irrigation; they have erected quite elaborate devices to aid in this. The observations in meteorology are being carried on by this department, including several sets of observations with reference to rate of evaporation under differing conditions.

The whole subject of experiment is to undergo a careful examination at the hands of the board of agriculture, in order that the efficiency of the college in this direction shall reach the maximum if possible. The passage of a bill by congress creating experiment stations in connection with each agricultural college in our country has turned the attention of the public quite strongly toward this subject, and it is probable that an amendment to the law will soon give the necessary funds for the prosecution of the work, and Colorado should be among those who lead in this direction.

CALENDAR.

1887-88.

SEPTEMBER.

S	M	T	W	T	F	S
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	..

OCTOBER.

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20	31	..	..	..	..	..

NOVEMBER.

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DECEMBER.

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JANUARY.

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29	30	31	..	..	..	..
..	..	..	..	..	..	..

FEBRUARY.

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26	27	28	29	..	..	..

MARCH.

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25	26	27	28	29	30	31
..	..	..	..	..	..	..

APRIL.

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MAY.

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20	21	22	23	24	25	26
27	28	29	30	31	..	..

JUNE.

S	M	T	W	T	F	S
..	..	..	..	..	1	2
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	..	..	..	..	..	..

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REGISTER

—OF THE—

OFFICERS AND STUDENTS

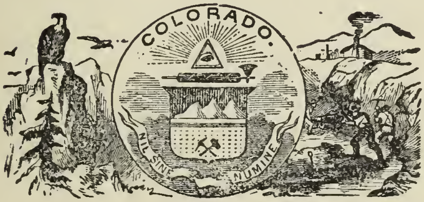
—AND—

COURSES OF INSTRUCTION

—IN THE—

STATE AGRICULTURAL COLLEGE,

FORT COLLINS, COLO.



1887--88.

PRINTED BY
THE FORT COLLINS EXPRESS
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FORT COLLINS, COLO.
1888.

MEMBERS

OF THE

STATE BOARD OF AGRICULTURE.

	Term Expires.
HON. FRANK J. ANNIS, Fort Collins	1895
HON. CHARLES H. SMALL, Pueblo	1895
HON. R. A. SOUTHWORTH, Denver	1893
HON. GEORGE WYMAN, Longmont	1893
HON. B. S. LAGRANGE, Greeley	1891
HON. W. F. WATROUS, Fort Collins	1891
HON. JOHN J. RYAN, Loveland	1889
HON. ROBERT C. NISBET, Del Norte	1889
HIS EXCELLENCY, GOV. ALVA ADAMS, PRESIDENT CHARLES L. INGERSOLL,	*Ex-Officio.*

30830

OFFICERS OF THE STATE BOARD.

HON. GEORGE WYMAN,	President
HON. FRANK J. ANNIS,	Secretary
HON. PETER W. BREENE, (*Ex-Officio*),	Treasurer

COMMITTEES.

COLLEGE BUILDINGS.

B. S. LaGrange, C. H. Small, W. F. Watrous.

EXPERIMENT STATIONS AND SCIENTIFIC EXPERIMENTS.

F. J. Annis, C. L. Ingersoll, R. A. Southworth.

FARM.

B. S. LaGrange, R. A. Southworth, J. J. Ryan.

FINANCE.

J. J. Ryan, W. F. Watrous, C. H. Small.

FACULTY, TEXT BOOKS AND COURSE OF STUDY.

F. J. Annis, R. A. Southworth, B. S. LaGrange

HORTICULTURE.

W. F. Watrous, R. C. Nisbet, F. J. Annis.

MATHEMATICS AND ENGINEERING.

R. C. Nisbet, B. S. LaGrange, R. A. Southworth.

MECHANICS AND CHEMISTRY.

C. H. Small, F. J. Annis, W. F. Watrous

VETERINARY SCIENCE AND STOCK.

R. A. Southworth, R. C. Nisbet, J. J. Ryan

FACULTY OF INSTRUCTION.

CHARLES L. INGERSOLL, M. S.,
President, Professor of Political Economy and Logic.
AINSWORTH E. BLOUNT, A. B.,
Professor of Agriculture.
JAMES CASSIDY, B. S.,
Professor of Botany and Horticulture.
JAMES W. LAWRENCE,
Professor of Mechanics and Drawing.
MAJOR VASA E. STOLBRAND,
Professor of Mathematics and Military Science.
*ELWOOD MEAD, B. S., C. E.,
Professor of Physics and Engineering.
MAUD BELL,
Professor of History, Literature and Modern Language.
DAVID O'BRINE, E. M., D. Sc., M. D.,
Professor of Chemistry and Geology.
———————— ————,
Professor of Veterinary Science and Zoology.
GRACE PATTON, B. S.,
Instructor in College and Preparatory Department.
FRANK J. ANNIS, M. S.,
Secretary.

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*Resigned April 2, 1888.

REGISTER OF STUDENTS.

1887-88.

POST GRADUATES.

Gill, Eleanor F., B. S.,	Fort Collins,	Colorado.
Stratton, Daisy E., B. S.,	"	"

SENIOR CLASS.

Coffin, Lewis A.,	Longmont,	Colorado.
Griffin, Harvey H.,	Island Station,	"
Lee, Josephine,	Fort Collins,	"
McLain, Genevieve E.,	Timnath,	"
Ramsey, William A.,	Denver,	"

JUNIOR CLASS.

Bell, Lucy,	*Chester*,	*New Hampshire.*
Davis, Arthur L.,	Arvada,	Colorado.

SOPHOMORE CLASS.

Bennett, William H.,	Fort Collins,	Colorado.
Benson, Clarence V.,	Loveland,	"
Benson, Vellie V.,	"	"
Buffum, Burt C.,	Fort Collins,	"
Caley, Frank R.,	Littleton,	"

Duncan, Charles A.,	Timnath,	Colorado.
Earnest, Carrie L.,	Fort Collins,	"
Eaton, Bruce G.,	Greeley,	"
Galbraith, Sam V.,	Fort Collins,	"
Hice, Lida,	"	"
Lunn, Nellie E.,	"	"
McClelland, H. S.,	"	"
McClelland, J. H.,	"	"
Plumb, Antoinette M.,	Erie,	"
Sippel, John T.,	Parlins,	"
Suiter, Charles,	Fort Collins,	"
Temple, Harry R.,	*Chico Springs,*	*New Mexico.*
Thoman, Cora B.,	Fort Collins,	Colorado.

FRESHMAN CLASS.

Bennett, Fred W.,	Fort Collins,	Colorado.
Calkins, John S.,	Semper,	"
Cameron, Robert A.,	Denver,	"
Carpenter, Don A.,	Fort Collins,	"
Covington, Cleo,	"	"
Davidson, Mary M.,	"	"
Denslow, Leo,	"	"
DeVotie, Frank,	Greeley	"
Elton, Carrie I.,	Fort Collins,	"
Evans, Charles R.,	"	"
Furniss, Edward C.,	Hillside,	"
Galbraith, Azel D.,	Fort Collins,	"
Galucia, Amy L.,	Buckhorn,	"
Handy, George H.,	Fort Collins,	"
Hankins, Ida M.,	Loveland,	"
Hankins, U. S.,	"	"
Harrington, Cora,	Bellevue,	"
Inglefield, Maud J.,	Fort Collins,	"
Jordan, William H.,	Pueblo,	"
Kern, John W.,	Timnath,	"
Loomis, Guy,	Fort Collins,	"

Marshall, Edward T.,	Denver,	“
Maxwell, Lulu M.,	Fort Collins,	“
McLain, Minnie E.,	Timnath,	“
Neville, Frank G.,	Arkins,	“
Prendergast, Stephen,	Fort Collins,	“
Prendergast, Wilfred,	“	“
Rand, Hattie,	Arvada,	“
Sturdevant, H. Arthur,	Fort Collins,	“
Stratton, Sophy,	“	“
Temple, Frank L.,	*Chico Springs,*	*New Mexico.*
Wells, Marcus E.,	Castle Rock,	Colorado.
Willard, Will W.,	Aspen,	“
Williams, Harry F.,	Greenland,	“
Wilkins, Clara A.,	Fort Collins,	“
Woods, George D.,	“	“
Woods, Herbert I.,	“	“

PREPARATORY CLASS.

Atwood, Joseph T.,	Longmont,	Colorado.
Baker, Willis H.,	Jefferson,	“
Beasley, Thomas N.,	Longmont,	“
Bell, Alice,	*Chester,*	*New Hampshire.*
Bristol, Bertha A.,	Fort Collins,	Colorado.
Brown, Alice E.,	“	“
Bowles, Edward V.,	Littleton,	“
Buffum, George H.,	Fort Collins,	“
Comstock, Harry L.,	Golden,	“
Donnelly, Emma E.,	*Taloga,*	*Kansas.*
Gross, Fred W.,	Fort Collins,	Colorado.
Hilton, Laura N.,	“	“
Hockaday, Claude,	Buena Vista,	“
Hogarty, Will P.,	Greeley,	“
Jester, Herbert H.,	Boulder,	“
Lapham, B. Archie,	Sedalia,	“
Livingston, Frank N.,	Fort Collins,	“

Livingston, Howard V.,	“	“
McGee, Edward,	Aspen,	“
McMillan, John C.,	Denver,	“
Naylor, Dora A.,	Loveland,	“
Nelson, John,	Fort Collins,	“
Nicholls Jr., John,	Golden,	“
Patton, Jessie,	Fort Collins,	“
Peabody, Jr., D. G.,	Denver,	“
Pease, Augustus,	Canon City,	“
Peebles, Frank,	Satank,	“
Porter, Ralph B.,	*Laramie City,*	*Wyoming Ter.*
Purcell, Mary J.,	Fort Collins,	Colorado.
Rand, Louisa,	Arvada,	“
Rand, John H.,	“	“
Ramsey, Luella,	Denver,	“
Ratcliff, Richard,	Castle Rock,	“
Russell, Platt A.,	Rocky Ford,	“
Saxton, Cora A.,	Fort Collins,	“
Seevers, Paul B.,	*Cheyenne,*	*Wyoming Ter.*
Suiter, Henry W.,	Fort Collins,	Colorado.
Thompson, Frank H.,	Greenland,	“

SPECIAL STUDENTS.

Bourse, Fanny A.,	Fort Collins,	Colorado.
Coffin, Gertrude,	“	“
Handy, Harry,	“	“
Hice, Austin G.,	“	“
Kissock, J. A. C.,	“	“
Silcott, Lillie M.,	“	“
Youtsey, Alice E.,	“	“

RECAPITULATION.

Post Graduates,	2
Seniors,	5
Juniors,	2
Sophomores,	18
Freshman,	37
Preparatory,	38
Special students,	7
Total,	109

Male Students,	71
Female Students,	38
Total,	109

POSTOFFICES REPRESENTED.

Colorado,	28
Wyoming Ter.	2
New Mexico,	1
Kansas,	1
New Hampshire,	1
Total,	33

COLLEGE CADETS.

ROSTER OF BATTALION.

MAJOR V. E. STOLBRAND, 1ST COLO. INFANTRY, Commandant.
(Late 13th U. S. Infantry.)

STAFF.

Acting Adjutant—J. H. McCLELLAND.
Acting Serg't Major—FRANK DeVOTIE.
Acting Color Sergeant—D. G. PEABODY, JR.

"A" COMPANY.

Captain,	H. H. Griffin
1st Lieutenant,	J. H. McClelland
2nd Lieutenant,	B. C. Buffum
1st Sergeant,	J. S. Calkins
Sergeant,	C. A. Duncan
Sergeant,	F. DeVotie
Sergeant	Guy Loomis
Corporal,	C. V. Benson
Corporal,	W. H. Jordan
Corporal,	F. R. Caley
Corporal,	U. S. Hankins
Privates,	23

"B" COMPANY.

Captain,	A. L. Davis
1st Lieutenant,	H. R. Temple
2nd Lieutenant,	H. S. McClelland
1st Sergeant,	D. A. Carpenter
Sergeant,	H. A. Williams
Sergeant,	Chas. Suiter
Sergeant,	George Woods
Corporal,	Geo. Peabody
Corporal,	M. E. Wells
Corporal,	John Kern
Corporal,	Ed. Marshall
Privates,	25

RECAPITULATION.

Commissioned,	3	“A” Co. Total,	34
Non-Commissioned,	8		
Privates,	23		
Commissioned,	3	“B” Co. Total,	36
Non-Commissioned,	8		
Privates,	25		
Aggregate,			70

GRADUATES.

1884.

Libbie Coy, B. S., Fort Collins, Colo.,........................Teacher
Leonidas Loomis, B. S., Green River City, Wyo.,..........Stockman
George H. Glover, B. S., D. V. M., Longmont Colo.,................
Assistant Veterinary Inspector, Southeastern Colo

1885.

Cora B. Blinn, B. S., Berthoud, Colo.,.........................Teacher
Edna L. Hice, B. S., Fort Collins, Colo.,.....................Teacher
Lelia Loomis, B. S., Fort Collins, Colo.,...................At home
Grace Patton, B. S., Fort Collins, Colo.,.............................
Instructor at the State Agricultural College
Robert E. Trimble, Fort Collins, Colo.,........Stockman and Farmer
Heien White, B. S., Fort Collins, Colo.,.....................At home

1886.

Wilbert J. Sickman, B. S., Fort Collins, Colo.,..............Merchant

1887.

Eleanor F. Gill, B. S., Fort Collins, Colo.,....................Teacher
Daisy E. Stratton, B. S., Fort Collins, Colo.,..................Teacher
Lerah G. Stratton, B. S., Fort Collins, Colo.,........................
Librarian State Agricultural College
E. G. Nettleton, B. S., Nampa, Idaho Ter.,.....Commission Merchant

1888.

Lewis A. Coffin, B. S., Colo.,..
Assistant Chemist, State Agricultural College
H. H. Griffin, B. S., Del Norte, Colo.,...................................
San Luis Valley Experiment Station
Josephine Lee, B. S., Eaton, Colo.,.........................Teacher
Genevieve E. McLain, B. S., Timnath, Colo.,................Teacher

Course of Study and Labor.

PREPARATORY YEAR.

FIRST TERM.

Arithmetic,	Sanford's Analytic
Elocution,	Fenno
Word Analysis,	Swinton

Labor, two hours, farm.

SECOND TERM.

Arithmetic,	Sanford's Analytic
English Analysis,	Kellogg
U. S. History,	Johnson

Labor, two hours, shop practice,

THIRD TERM.

Algebra,	Wentworth
Physical Geography,	Houston
English Analysis,	Kellogg

Labor, two hours, garden.

Penmanship, one exercise each week.
Military drill, four exercises a week.

FRESHMAN YEAR.

FIRST TERM.

Algebra,	Wentworth
Ancient History,	Swinton
Book Keeping,	Meservey

Labor, two hours, garden.

SECOND TERM.

Algebra,	Wentworth
Ancient History, half term,	Swinton
English Literature, half term,	Kellogg
Botany,	Gray, with Coulter's Flora

Labor, two hours, shop practice.

THIRD TERM.

Geometry,	Wentworth
English Literature,	Kellogg
Botany,	Gray, with Coulter's Flora

Labor, two hours, farm.

Composition and Rhetoric, one exercise a week.

Military drill, four exercises a week.

SOPHOMORE YEAR.

FIRST TERM.

Geometry,	Wentworth
Chemistry,	Norton
Drawing,	Lectures and practice

Labor, two hours, Laboratory practice.

SECOND TERM.

Trigonometry,	Wentworth
Physiology,	Martin
Drawing,	Lectures and practice

Labor, two hours, Laboratory practice.

THIRD TERM.

Surveying,	Davies
Physiology,	Martin
Drawing,	Lectures and practice

Labor, two hours, field surveys, etc.

Civil Government and Constitution, one exercise a week.

Military drill, four exercises a week.

The course from this point is separated into: 1—The Agricultural course; 2—The Mechanical course.

The Agricultural Course.

JUNIOR YEAR.

FIRST TERM.

Physics,	Deschanel
Zoology,	Packard
Hydraulics and Reservoirs,	Fanning

Labor, two hours, experiments.

SECOND TERM.

Physics,	Deschanel
Geology,	LeConte
Agricultural Chemistry,	Lectures

Labor, two hours, Laboratory practice.

THIRD TERM.

Physics,	Deschanel
Entomology,	Lectures
Agriculture,	Lectures

Labor, two hours, Laboratory practice.

Analytic Geometry and Conic Sections, one exercise a week.

Military drill, four exercises a week.

The Agricultural Course.

SENIOR YEAR.

FIRST TERM.

Psychology,	Porter
Landscape Gardening,	Kemp
Agriculture,	Lectures

Labor, two hours, farm, three exercises a week.

Microscopy, two hours, two exercises a week.

SECOND TERM.

Logic,	Fowler
Horticulture,	Lectures
Irrigation Law,	Lectures

Labor, two hours, garden. three exercises a week.

Microscopy, two hours, two exercises a week.

THIRD TERM.

Political Economy,	Wayland-Chapin, and lectures
Horticulture,	Lectures
Canal work,	Lectures

Labor, two hours, garden, three exercises a week.

Microscopy, two hours, two exercises a week.

Astronomy, one exercise a week, one-half year.

Meteorology, one exercise a week, one-half year.

Military drill, four exercises a week.

A thesis is required of each student at close of the work in Microscopy.

The Mechanical Course.

JUNIOR YEAR.

FIRST TERM.

Physics,	Deschanel
Zoology,	Packard
Drawing,	Lectures and practice

Labor, two hours, shop practice.

SECOND TERM.

Physics,	Deschanel
Geology,	LeConte
Drawing,	Lectures and practice

Labor, two hours, shop practice.

THIRD TERM.

Physics,	Deschanel
Entomology,	Lectures
Drawing,	Lectures and practice

Labor, two hours, shop practice.

Analytic Geometry and Conic Sections, one exercise a week.

Military drill, four exercises a week.

The Mechanical Course.

SENIOR YEAR.

FIRST TERM.

Psychology,	Porter
Landscape Gardening,	Kemp
The Steam Engine,	Lectures

Labor, two hours, shop practice.

SECOND TERM.

Logic,	Fowler
Horticulture,	Lectures
Transmission of Power,	Lectures

Labor, two hours, shop practice.

THIRD TERM.

Political Economy,	Wayland-Chapin
Horticulture,	Lectures
Study of special Machines,	Lectures

Labor, two hours, shop practice.

Astronomy, one exercise a week, one-half year.
Meteorology, one exercise a week, one-half year.
Military drill, four exercises a week.

LADIES' COURSE.

The young ladies pursue the same course as the young men during the first three years. During the Junior and Senior years they may, if they choose, substitute the study of German for the special studies of the Agricultural course, or the Mechanical course, found in the third line of work laid down in the foregoing schedule.

Recitation Scheme—Fall Term.

TIME.	PREPARATORY.	FRESHMAN.	SOPHOMORE.	JUNIOR.	SENIOR.
9 a. m.	Arithmetic.	Ancient History.	Drawing	Physics.	Landscape Gardening.
9:50	Elocution.	Algebra.	Chemistry.	Zoology.	Psychology.
10:40.	Word Analysis.	Book Keeping.	Geometry.	Hydraulics, etc., Drawing, German.	Agriculture, Steam Engine.
Friday. 11:30	Penmanship.	Composition.	Civil Government.	Analytic Geometry.	Astronomy
4 days.	Military Drill.	Military Drill.	Military Drill.	Military Drill.	Military Drill, German.
1:30 p. m to 3:30 p. m.	Labor, Farm.	Labor, Garden.	Labor, Chemical Lab.	Labor, experiments, etc., 3 days. Zoological, Lab. 2 days	Labor, Microscopy, 2 days. Farm, 3 days. Shop, 5 days.

Recitation Scheme—Winter Term.

TIME.	PREPARATORY.	FRESHMAN.	SOPHOMORE.	JUNIOR.	SENIOR.
9 a. m.	Arithmetic.	Literature.	Drawing.	Physics.	Horticulture.
9:50.	English Analysis.	Algebra.	Physiology.	Geology.	Logic.
10:40.	U. S. History.	Botany.	Trigonometry.	Agricultural Chemistry. Drawing, German.	Irrigation Law. Power, Transmission.
Friday, 11:30,	Penmanship.	Composition.	Civil Government.	Analytic Geometry.	Astronomy. ½ term, Meteorology, ½ term.
4 days.	Military Instruction.	Military Instruction.	Military Instruction.	Military Instruction.	Military Instruction. German.
1:15 p. m. to 3:15 p. m	Labor, Shop, First Division.	Labor, Shop, First Division.	Labor, Chemical Laboratory.	Labor, Chemical Lab. Shop.	Microscopy, 2 days. Garden, 2 days Shop, 5 days.
3:15 p. m. to 5:15 p. m,	Labor, Shop, Second Division.	Labor, Shop, Second Division.			

Recitation Scheme—Spring Term.

TIME.	PREPARATORY.	FRESHMAN.	SOPHOMORE.	JUNIOR.	SENIOR.
9 a. m.	Algebra.	Literature.	Drawing.	Physics.	Horticulture.
9:50.	Phys. Geography.	Geometry.	Physiology.	Entomology.	Political Economy.
10:40.	English Analysis.	Botany.	Surveying.	Agriculture. Drawing, German.	Canal Work. Special Machines.
Friday, 11:30, 4 days.	Penmanship.	Composition.	Civil Government.	Conic Sections.	Meteorology.
	Military Drill.	Mil'tary Drill.	Military Drill.	Military Drill.	Mil. Drill, German.
1:30 p m. to 3:30 p. m	Labor, Garden.	Labor, Farm.	Labor, Field Surveys, etc.	Labor, Chemical Laboratory, Shop.	Labor, Microscopy, 2 days. Field Work, 3 days. Shop.

The Agricultural Experiment Station.

OFFICERS:

EXECUTIVE COMMITTEE IN CHARGE.

Hon. John J. Ryan, Hon. W. F. Watrous,
Hon. George Wyman.

Charles L. Ingersoll, M. S.,	Director
Frank J. Annis, M. S.,	Secretary and Treasurer

WORKING STAFF.

Ainsworth E. Blount, A. B.,	Agriculturist
James Cassidy, B. S.,	Botanist and Horticulturist
David O'Brine, E. M., D. Sc. M. D.,	Chemist
*Elwood Mead, B. S., C. E.,	Meteorologist and Irrigation Engineer

ASSISTANTS.

Ransom H. McDowell, B. S.,	Agriculture
Max C. Brose,	Horticulture
Lewis A. Coffin, B. S.,	Chemistry
G. H. Keeney,	Meteorology and Irrigation Engineering
Harvey H. Griffin, B. S.,	San Luis Valley Experiment Station

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*Resigned April 2, 1888.

AGRICULTURAL EXPERIMENT STATION.

Under the provisions of the Hatch Act, creating Experiment stations at Agricultural Colleges and other schools which availed themselves of the benefit of the act of July 2, 1862, and supplementary acts relating thereto, the State Board of Agriculture organized a department to be known as "The Agricultural Experiment Station," to consist of this department at the State Agricultural College, at Fort Collins, Colorado, and such auxiliary stations as the Board may from time to time establish.

The Board proceeded to elect officers and working staff, and to establish an auxiliary station in San Luis Valley, Rio Grande county, Colorado.

The object of this organization is to experiment in various lines for the benefit of Agriculture and Horticulture, and to distribute the results of this labor in the form of bulletins to all who are interested in the work; also, to distribute seeds and plants of improved varieties for the benefit of the people of Colorado.

For bulletins, or seeds, address,

AGRICULTURAL EXPERIMENT STATION,
Fort Collins, Larimer County, Colorado.

DEPARTMENTS OF

INSTRUCTION AND LABOR.

AGRICULTURE.

The study is pursued by a source of lectures in the third term of the Junior year, in which are discussed the various breeds of horses, cattle, sheep, swine and poultry; their peculiarities, history, adaptation, etc., etc.; cereals, preparation of the soil, seeding, harvesting, threshing, marketing; laying out a farm, improvements; farm and public roads, bridges, culverts; location and erection of buildings.

In the Senior year the student is given more instruction in this line after he has pursued thoroughly those branches of science which underlie, or are closely related to agriculture.

Farm yard manures, their application and utility; irrigation and its application; dairy husbandry; farm accounts; rotation of crops; drainage; farm implements; improvement of cereals by selection, crossing and care, and the careful employment and superintendence of labor.

Students labor upon the farm and experimental ground two hours each school day of the Fall and Spring terms.

"Labor and study, theory and practice go hand in hand. To know how and when to do work well is a science; to acquire the skill is an art. That they may obtain the science, study is necessary; to get the art, work is indispensable."

BOTANY.

The instruction in Botany is very full and complete, commencing with the study of vegetable physiology, and proceeding to structural and systematic Botany. After a thorough study of principles, the students are required to study the plants, and in this way to fix in their minds the principles before so thoroughly scanned. Two terms of the Freshman year are devoted to the foregoing work. The green house furnishes ample material for work, distributed over a large number of botanical families. Our facilities for instruction in this branch are unsurpassed. In the Senior year the students take up the work of Microscopy, in which the study of Histology is pursued. Many plants and organs are examined by sections, and the student required to make drawings and permanent mountings of the same. In this manner the students become prepared to make independent investgations in various directions, in after life.

CHEMISTRY.

It is the object of this department to give the student an opportunity to acquire a thorough mastery of the elementary principles of chemical science. To attain this object, theory and practice are made to go hand in hand. In the first term of the Sophomore year, the class listens to a series of lectures upon the general theory of the science, its history and development. In this course of lectures are discussed the subjects of acids, bases and salts, and the principles of chemical philosophy. The natural history, chemical and physical properties of each of the elements are discussed in detail, the whole being illustrated by numerous experiments. While taking this course, the student spends two hours each day in the chemical laboratory, repeating the experiments shown in the class room, and others which may be suggested, thus serving to familiarize the student with the various forms of compounds, the marked distinctions between the different classes of salts, the use of chemical nomenclature, and the manipulation of apparatus. Practice in the use of the blow pipe accompanies this work, and an insight into determinative mineralogy is thus acquired. The use and application of the spectroscope is also taught. The students in the laboratory at the end of the first term are examined by *unknown bodies* in the dry way. In the second term of the Sophomore year there is given a course of lectures on Organic Chemistry, continuing for six weeks, one hour daily. The laboratory work continues during the term, and the student takes up the tests for the bases and their separation ; also, the tests for the acids and their separation. The students are examined at the close of the second term by unknown bodies, mixtures of the several groups of bases and acids. Finishing the work of qualitative analysis in the wet and dry ways.

In the second term of the Junior year, the student listens to a course of lectures upon Agricultural Chemistry, in which are discussed such subjects as the following : Relation of Chemistry to agriculture ; the literature of agricultural Chemistry ; elements of plant growth, their relative abundance and importance; the atmosphere, the soil, fertilizers, etc. During this term the class spends two hours daily in the laboratory, when the students pursue the study of quantitative analysis, both volumetric and gravimetric, and will also be directed in any line of special work they may desire. He will have an opportunity to see in the station laboratory the analysis of food, blood, poisons, urine, water, coal, minerals, soils, assaying and gas analysis. Keeping in mind the object for which our College is founded, we have so planned our Chemical course as to prepare the student for the general application of Chemistry in relation to the industrial arts, while seeking especially to thoroughly ground him in the application of the science to agriculture. A new chemical laboratory, fitted up with all the modern appliances, will be ready for the classes for next year. Text books are Norton's Chemistry and O'Brine's Laboratory Guide. Beside the current chemical literature, the following books of reference are accessible to the students of this department: Watt's dictionary of Chemistry, the works of Roscoe, Schorlemmer, Bloxam, Tidy, Miller, Stricker, Pinney, Fowne, Wagner; in analysis, the works of Fresenius, Wills, Classen, Prescott, Thorpe, Wohler, Crooke's Select Methods, Allen's Organic Analysis, Hart, Sutton, Blythe, etc.

GEOLOGY.

Recognizing the fact that Chemistry and Geology are the foundation of agricultural science, the subject of Geology receives corresponding attention. The second term of the Junior year LeConte's elements of Geology is taken up, and continued during the year. The third term besides the class room work, the students work two hours each day in the laboratory, identifying the fossils and rocks, and in determinative mineralogy. Lectures on Economic Geology are also given, using Williams' manual as a guide. Frequent visits to the mountains and quarries illustrate the practical application of dip, strike, fault, formations, stratifications, and elevation by barometer, thermometer and level, whenever field work is practicable. At the end of the third term the students are required to identify and describe twenty-five rocks or mineral specimens.

The following works of reference are accessible to the students: Croll, Bischof, Lyell, Dana, Nicholson, Geikie, VonCotta, Platner, Brush, Elderhorst, and the geological reports of other states.

Any donations to these departments will be thankfully received, and due credit given in the catalogue.

Donations have been received from G. T. Wilkins, specimens in photography; A. N. Hoag, specimens of native wines; J. H. Keeney, of Stout, footprints of animals of early geologic ages; C. F. Davis, specimens of alcoholic liquors; Kissock & Trimble, specimens of spices; Harmony Mills, specimens illustrating the changes in manufacture of flour by roller process.

HORTICULTURE.

Instruction in the several branches of Horticulture is given as follows: In practical Floriculture, by lectures upon such topics as the construction, heating and management of green houses; the propagation of plants by seed, cutting, layers, budding and grafting; how budding and grafting are performed, and their uses; the cultivation and general management of green house plants for commercial or private purposes; insects, and diseases of plants under glass, with remedies therefor; parlor gardening, Wardian cases and ferneries; arrangement of flowers in bouquets and floral designs.

Instruction in Pomology is given by lectures, and embraces a theoretical and practical study of the propagation, planting, pruning and general management of orchards and small fruit gardens; insect enemies, diseases and varieties best adapted to this latitude; classification of fruits by form; habit of growth; flowers and leaves.

Vegetable culture comprises kitchen and market gardening, and seed growing, and the principle topics considered are: The best situation for, and the laying out of, the garden with a view to its irrigation, and most economical management in the rotation and planting of crops for the family and for market; management of composts and commercial fertilizers; care of tools; selection and growing of seeds; construction, management and uses of hot-beds and cold-frames; harvesting, marketing and storing of fruits and vegetables.

Forestry is taught by lecture, special attention being given to such topics as the value of trees and shrubs for timber and ornament, for hedges, screens and shelter best for this state; the best methods of culture, with a history of varieties especially such as are thought worthy of trial in this latitude.

Landscape gardening is taught in the Senior year by regular study of text book: Kemp's "How to lay out a Garden," and lectures, adapted as much as possible to the exigencies of this climate, frequent use being made of the grounds, and their planting for illustration. The orchards, nursery, green house, vegetable garden and flower garden afford ample opportunity to the student to acquire a practical acquaintance with the above topics. Each student, before completing the study, must complete a formal plat, arranged with reference to the best principles of the art.

MATHEMATICS.

The instruction offered by this department is designed to conform to the general aim and purpose of the institution; accordingly, only those branches of pure mathematics are taught which the student will find of greatest service in after life. The instruction in this portion of the subject being about the same as that of classical colleges, while the attention given to applied mathematics, including surveying and engineering, is much greater than that of the usual college course.

Arithmetic—Students entering the Preparatory year, in the first and second terms, pay especial attention to decimal notation and general analysis, covering the several departments of commercial arithmetic.

Algebra—The study of Algebra occupies the last term of the Preparatory year, and the first and second terms of the Freshman year. In the first term the principal object is to thoroughly familiarize the student with the use of literal quantities and the processes of factoring. The second term's work is largely devoted to the study of the equation, and its uses in the solution of intricate problems in interest, common discount and alligation, and for the demonstration of geometrical and trigonometrical theorems. The last term is given to higher Algebra. Through this study two objects are kept prominently in view: First, to give the pupil facility in the use of algebraic processes, and second, to train him to methods of reasoning rather than operating.

Geometry—Geometry is placed in the third term of the Freshman year, and the first term of the Sophomore year. Problems in mensuration and original exercises will be added to the routine text book work, giving the student frequent practice in the application of principles already acquired, and enabling him to fix more firmly the knowledge gained.

Trigonometry and Surveying—Trigonometry is taught during the second term of the Sophomore year. This is followed in the third term by surveying; the instruction in which will be part by lectures, and includes theory, adjustment and use of instruments, and the history of the United States government surveys. In addition to the class room exercises, the students will be required to devote from two to three hours daily to practice in the field. They will take their own notes, from which they will be required to submit computations, accompanied by drawings made to scale.

MILITARY SCIENCE.

The instruction offered by this department is intended to conform not only to United States and state laws, but to accustom the student to habits of prompt, yet not machine obedience; to foster and cultivate the ardor and the natural martial instinct so inherent in our national character; to teach him the why and wherefore of, obedience first,—questioning, if any, afterwards—(the maxim so necessary to be observed in all military operations); and to prepare him should necessity arise, to organize and drill a company or battalion of our national mainstay—the citizen soldiery.

Military drill is required of each male student, unless excused for physical disability, or by special vote of the faculty for special, satisfactory reasons. Each cadet is required to purchase a copy of the standard Infantry Tactics of the United States army for study and reference; he is also to provide himself with a regulation uniform, modeled somewhat after the fatigue uniform of the regular army; it is neat, comprising coat, pants, cap and gloves, and is not costly.

In the fall and spring terms a period of fifty minutes is devoted to the practical application of the theory taught in the class room in the winter term. An encampment will take place at the close of the spring term for special drill in guard and other duties, whenever circumstances will permit.

PRACTICAL MECHANICS.

The old system of apprenticeship is rapidly becoming a thing of the past, and it is now almost impossible for a boy to learn a trade in any modern shop or factory. This is owing largely to the introduction of special machinery, necessitating special workmen to manage it, and the workman who has learned to run a machine of this kind is kept at that work, as being most profitable to his employer. His practical knowledge of other methods and machines is, therefore, confined to narrow limits, and should a vacancy occur in a superior position, he is not fitted for the place, from the fact of his being unacquainted with other practical parts connected with his trade, the manipulations and principles involved in which he has not had an opportunity to learn.

This department has for its object a systematic and progressive education in the use of tools and materials, combined with as much theoretical knowledge as shall be deemed necessary to explain the principles involved. It does not teach special trades, nor manufacture salable articles; to do so would require that the student be kept on the kind of work he could do best, and thus prevent him from acquiring broad and liberal ideas of other methods. So, without teaching any one complete trade, the mechanical principles of many are gained. This does not necessarily mean that the student becomes sufficiently expert to compete with the skilled mechanic, but that a knowledge of *how* a tool or machine should be used, and the manner of *laying out work* for the same is thoroughly taught.

Should the circumstances be such that the student enter manufacturing, his ideas having been broadened by this training, he will the more readily grasp anything new that may come up in his business, or, if he take up farming, he will, with greater ease, be able to understand the mechanical principles and workings of his machinery, and also how to keep it and his buildings in proper repair.

The shop instruction will be divided into courses as follows, and in each course will be given, in connection with the work, an explanation of the construction of each tool, and its manner of acting on the material, the methods of determining how to select materials best suited to different kinds of work, the manner of laying out work, cutting, speed of tools, etc.

COURSE OF LABOR.

FIRST YEAR.

Bench work in wood,	14	weeks.
Machine work in wood,	4	"
Pattern making,	12	"
Vise work in iron,	10	"

SECOND YEAR.

Iron forging,	14	weeks.
Steel forging,	4	"
Machine work in iron,	20	"

BENCH WORK IN WOOD.

This course consists of exercises with the different wood working bench tools, so arranged in a graded series as to embrace the manipulation of the tools in their various applications.

First—The use of planes in joining, smoothing and getting the piece out of wind, lining off, and the use of saws in cutting across and with the grain and keeping to line.

Second—Halved splice.

Third—Splayed splice.

Fourth—Keyed splice.

Fifth—Open dovetail mortise and tenon joint.

Sixth—Mortise and tenon joint.

Seventh—Open dovetail joint.

Eighth—Blind dovetail joint.

Ninth—Lap joint.

Tenth—Dowel joint.

Eleventh—Small newel post with hand worked rail.

Twelfth—Panel door.

Thirteenth—Roof truss.

Fourteenth—Box.

Fifteenth—Carpenter's trestle.

MACHINE WORK IN WOOD.

In connection with this course, with the use of tools, will be given the most rapid and economical method of selecting and preparing the wood for the machine. There will be given examples of

First—Straight turning.

Second—Cutting in and squaring off.

Third—Convex, concave and compound curves.

Fourth—Handles for chisels and other tools.

Fifth—Examples in chuck work in separate and combined pieces.

Sixth—How to turn a ball.

PATTERN MAKING AND FOUNDRY WORK.

After becoming familiar with bench and machine work in wood, an application of both is made, by constructing patterns with due regard to shrinkage, draft, and the best method of constructing the pattern, so that it causes the least amount of trouble in the foundry There will be given examples of

Plain work.

Core work.

Pully work.

Pipe work.

Gear work.

Core boxes, their use and construction.

And in the foundry will be given practice in moulding in plain and core work.

VISE WORK IN IRON.

With this course will be given an explanation of the different kinds of tools and their effect on the material, and the style of tool to be selected for certain kinds of work. There will be given examples in

Chipping cast iron, wrought iron and steel.

Spline chipping.

Hack sawing.

Filing square and round surfaces to line.

Shoulder, point and other free hand filing.

Fitting joints.

Finishing and scraping.

FORGING IN IRON AND STEEL.

Care of the fire.

The effect of different heats on the material.

Drawing, upsetting, bending.

Scarf, fork, jump and other styles of welding.

Welding iron to iron, iron to steel, steel to steel.

Rings, chains, ring bolts, brackets, braces, heading tools, nails, bolts, hooks, hasps, swivels, tongs, cattle brands.

Steel wrenches, cold chisels, drills, lathe tools, springs, etc.

Examples in tempering and case hardening.

MACHINE WORK IN IRON.

Care of the machines, their construction, proportion and use of the different parts.

Cutting speed of tools, and proper angle of cutting edge for different purposes and different metals.

Centering and straightening work.

Straight turning and squaring.

Boring.

Making and fitting joints.

Chuck work.

Screw cutting inside and outside.

Drilling, tapping and reaming.

Boring with boring bar and use of center rest.

Polishing and finishing.

Hand tool work.

DRAWING.

FIRST TERM.

Geometrical problems.

Free hand copy and dictation.

Designs.

Linear perspective.

Model and object drawing.

SECOND YEAR.

Orthographic and Isometric projections, and projection of shadows.

Development and intersection of surface.

Light and shade.

Historical ornament.

Wood carving, diaper, incised and relief.

Persons having parts of machines, patterns, small models or working drawings, may, if they choose to donate the same to the department, confer a great favor upon the college, and especially upon the department.

PHYSICS.

The study of Mechanical and Chemical Physics will continue for three terms. The first term will be devoted to the study from text book of the mechanics of solids. The second term will be given to the subjects of Hydrostatics, Pneumatics, Acoustics and Optics. In the last term will be given the subjects of Heat, Electricity and Magnetism, from the standpoint of Chemical Physics. The whole subject of Physics will be illustrated, where practicable, by apparatus and experiment.

IRRIGATION ENGINEERING.

The instruction in this department is designed to acquaint the student with the theoretical and practical features of Irrigation as applied to the agriculture of the arid region.

The course includes the fall term of the Junior year, and the winter and spring terms of the Senior year. During the fall term of the Junior year the students pursue a very thorough course in the theory and practice of water measurement. This includes the pressure against reservoir embankment or discharge pipes; the laws governing the flow through pipes in open channels, over weirs, and the discharge through the different forms of measuring orifices in use in this or other irrigation countries. In connection with the study of the laws governing the pressure of water against embankments, a series of lectures is given describing the construction of reservoirs and the discharge gates for the same.

Practical experiments are made in measuring the flow through canals, and the merits and defects of our methods of distributing water carefully studied. The work of the term ends with a series of lectures on the location, cost and management of pumping stations.

In the winter term of the Senior year a course of lectures is given on irrigation history, and of the systems and methods of this state, and of some of the principal irrigation districts of Europe; the student is enabled to form an intelligent opinion as to the merits of many of the perplexing and disputed problems that our rapid agricultural development has produced.

Physiology and Comparative Anatomy.

The study is begun in the second term of the Sophmore year, lectures being given on Anatomy, and followed by a thorough study of Physiology. Martin's "Human Body" is used as text book, supplemented by lectures.

Zoology.

This branch of study is begun in the Junior year and runs through fifteen weeks. The text book used is "Packard's Zoology," briefer course, supplemented by lectures and museum work, which consists of dissections, drawings and classification of animals. The college facilities in the line of skeletons and specimens of both marine and inland fauna are excellent, and additions are being constantly made.

Entomology—This branch of Zoology is studied more completely in a course of lectures in the Junior year, in which the subject of bee keeping receives especial attention. The instruction deals largely, after grouping and classifying, with the study of those species and genera of insects which are either beneficial or injurious to the agriculturist. In this connection are discussed the various known means and remedies of checking the ravages of those which are known to be injurious. Some laboratory work will be required of each student.

Microscopy.

In the Senior year the student takes up the subject of Microscopy. In this work the student begins the particular study of Histology, completing the work begun in Botany, by a study of many of the fungi, and accompanying the study of Physiology and Anatomy by the microscopical study of the structure of organs. The laboratory is fitted with Beck's economic microscopes, (furnished with two eye pieces, and one-half and one-sixth objectives, giving a magnifying power of from sixty to 800 diameters), and other necessary apparatus for the best of scientific work. The object of this work is to prepare the student to make independent investigations in various directions, and each student is required to work out carefully some particular topic for a thesis, in Biology, with careful notes, drawings and mounted specimens, which will be kept as the property of the institution. The theses are carefully bound and preserved in the library.

English.

The study is begun as a review of English analysis, and continued by the study of word analysis in the Preparatory year. The subject is carried forward by weekly exercises in composition during the entire Freshman year. During the first term, the class studies the subjects of punctuation, capitalization, the arrangement and structure of sentences and the fundamental principles of style. During the second and third terms, the class continues the subject of English composition, giving special attention to style, and becoming familiar with good English. It is the object of this work to give the student ability to write a plain, neat letter, properly spelled, punctuated and composed, and to give him some skill in the logical arrangement of his written thoughts.

History and Literature.

The entire Freshman year is devoted to these topics. The year begins with Ancient history, in which the text book is used, supplemented by lectures. The last half of the year is devoted to English history and cotemporaneous literature, interspersed with critical readings from selected authors.

German.

German is studied during the Junior and Senior years. The great increase of the German population in America during the last thirty years has made a practical knowledge of the German language a business commodity as well as an elegant accomplishment. A course of two years in German is not sufficient to give a mastery of the language, but the limited time of study is occupied in giving, as far as possible, power to converse in every day life. The recitations are conducted in the language studied, and much stress is placed upon the ability to converse as the most certain way to read and use German effectively.

Mental and Moral Science.

These studies are pursued in the Senior year, in such a manner as to give a good outline in each, which the student is expected to fill in largely by supplementary readings. Porter's "Elements of Intellectual Science" is used as text book and guide.

Logic.

The study of this branch is considered of prime importance, as in the presentation of the inductive we find the methods pursured for the advancement of science and the means of elimination of error from experiment. The term's work is equally divided between the inductive and the deductive methods.

Political Economy.

Wayland, lectures and discussions, are used. The short term only gives sufficient time to arouse an interest in the divisions of the subject, and its leading principles; the student is induced to read, to weigh carefully, and thus to act intelligently on the questions which interest us as a nation in our growth and increase of wealth.

Civil Government.

The study of the constitution of the United States and of the state of Colorado both conjoin to make more broad the mind of the student and the better fit him to take his place among the citizens of this or other states. These with other subjects relating to civics, will be given by a series ot exercises continuing through the Sophomore year; and thus early in the college course do we strive to urge thought in the direction of good citizenship.

Public Rhetoricals.

Each student enrolled shall render at least one public rhetorical exercise each college term, unless excused by faculty vote. These exercises shall consist of declamations and recitations for the younger classes, and original exercises for the advanced students. The importance of these exercises to the student can scarcely be estimated, as every one should have a training which will enable him to present his views upon any question in public in an intelligent and pleasing manner.

Degree.

Upon those who complete the work of the course as laid down, in a good and satisfactory manner, the State Board of Agriculture, upon recommendation of the faculty of instruction, confer the degree of Bachelor of Science. The fee for graduation is fixed at $10, without other public expense to the student.

The degree of Master of Science is conferred upon all graduates of the college in good standing, who have pursued thoroughly some line of work after graduation, and who submit an acceptable thesis on the same.

EXPENSES.

Matriculation (entrance fee, entitling the student to the privileges of full course),	$ 5 00
Incidental fee, per term,	1 00
Board in dormitory (including room rent, heat and light), per week (about cost)	3 35
Graduation fee,	10 00
Tuition,	Free
Uniform,	$15 00 to 20 00

Washing averages about seventy-five cents per dozen; no laundry is connected with the college. The college has dormitory accommodations for thirty, and the Board of Agriculture has assigned this building exclusively to the young men; hence young ladies seeking instruction here must find rooms and board in the city. Board can be obtained in private families at $4 to $6 a week, room rent included.

The rooms in the dormitory are each furnished with bedstead and stove; *Students must furnish all else*, including straw ticks or mattresses The conditions of occupancy are

1. Good conduct.

2. A care and preservation of property.

3. A willing and cheerful obedience of the rules governing that part of the college.

Total Expenses.

As some persons are desirous of knowing just what it may cost to attend school for a year, the following summary of approximate cost is made:

Matriculation fee, (paid once)	$ 5 00
Incidentals, three terms,	3 00
Board, thirty-six weeks, at $3.35 per week,	120 00
Washing (average), fifty cents per week,	18 00
Books (approximately),	15 00
Total,	$191 60

The uniform is not mentioned in this estimate, as it costs no more than a good suit of citizens' clothes, and, consequently, will not increase the expense.

In terms where the students labor on farm and garden, their wages go to lessen their expenses, so that an average of $150 will pay the yearly expenses of a student during the whole course, excluding clothing, traveling expenses and incidentals. The Sophomore and Junior years are a little more expensive than the others, as fees must be paid for use of chemicals and apparatus; also the terms when students work in the shop.

CHEMICAL FEES.

Sophomore year, first term,	$ 5 00
Junior year, first and second terms,	15 00
Total for chemical course,	$20 00

SHOP FEE.

A shop fee of $5 per term is charged to cover cost of material, and breakage or damage of tools. A fee of $2 per term is charged for the course in wood carving.

Advance Payment.

All fees must be paid in advance, and a receipt obtained from the secretary entitles the bearer to admission to the classes. Board must be paid monthly in advance to the steward in charge of the boarding hall, and no reduction is made unless for absence of a full week at one time. In such case, one-half the time is allowed. An absence of two consecutive weeks entitles one to full reduction of time. A student leaving before the end of the term has any excess or balance to his credit refunded to him on settlement.

MONEY NEEDED BY STUDENT ON ENTRANCE.

Matriculation fee,	$ 5 00
Incidental fee,	1 00
Board, (advance four weeks)	13 00
Room rent, (about)	1 00
Uniform,	18 00
Furniture for room, from $8 to $11,	10 00
Books,	5 00
	$53 00
Incidentals for washing, etc.,	6 00
Total,	$59 00

CONDITIONS OF ADMISSION.

The college is open to students of both sexes. Candidates for admission must be fifteen years of age, and unless personally known, must give good references. They must also pass an examination in the common branches, viz.: Reading, writing, spelling, grammar, arithmetic and geography. The work of the Preparatory year is, in part, a thorough and practical review of grammar and arithmetic, with the additional subjects of United States history, physical geography, elocution, word analysis and penmanship; consequently a candidate for admission to the Freshman class must pass an examination in these branches, and not receive conditions in more than two of them. In no case can one be conditioned on the study of arithmetic. Candidates for advanced classes or work must be examined on all previous work, or bring certificates of standing from schools having an equivalent grade of work.

Regular and Special Courses.

Unless there seem to be strong and excellent reasons for it, students will not be allowed to take a special course of study, and in case it is allowed, the student must show that he is well qualified to pursue the studies selected by passing such examinations as the faculty may assign. No student will be allowed to change his course during the progress of a term, nor will he be allowed to drop a study unless by permission of the faculty. A student will not be allowed to leave college in term time without leave of absence granted by the president or faculty, otherwise the student will be liable to suspension or expulsion. Temporary leave of absence can be granted by the president, or the officer in charge during his absence. Final separation from college must be acted upon by the faculty.

Labor.

The labor of students at the college is required by law; each student must labor two hours each school day, unless excused for physical disability. The labor at the college is of two classes: First, that which is performed solely for the purpose of instruction; second, that which is of some monetary value to the institution.

In the first class is placed all labor performed in chemical laboratory practice, in mechanic shop, in field surveying and leveling, and some labor in conservatory. In the second class is included all labor upon farm or garden, and extra time in the mechanic shop, when the student has acquired a sufficient degree of skill. The rate paid for labor of the second class varies with the skill and fidelity of the student. The maximum price is ten cents per hour. It is believed that the students of the Agricultural college or of any industrial school are able to accomplish as much in the line of study as if no labor were performed. At the same time, the labor helps to keep the physical nature strong and healthy, while the student, by learning well the principles of many trades and vocations, is made strong to grapple with the duties and responsibilities of life, while being educated to take his place among the best and most honored of our citizens of the future. The time that in many colleges is spent in revelry or athletic sports of questionable utility, is thus devoted to that which is not only a present benefit, by helping to support the student while in college, but gives him a ready means of support in many ways as soon as he leaves the college halls.

Discipline.

The discipline of the college is mild, but firm ; the faculty, however, reserve the right to suspend pupils with or without the knowledge of the parents, according to the circumstances of the case. Good conduct and effort is expected of all. When it becomes manifest from the deportment of any student that his presence is detrimental to the best interests of the school, either morally or otherwise, such student will be removed.

Dormitory Regulations.

Young men are expected to be at the dormitory at 7 p. m. each evening except Sunday, when they have permission to attend church if they choose. Study hours begin at 7 p. m. and close at 10 p. m. The time for retiring is fixed at 10:15 p. m.

Any marked violation of the above regulations will be followed by warning and advice ; if still persisted in, the student will be suspended from the dormitory if not from the college. Students boarding outside must obtain permission before visiting the dormitory. Damage to rooms or property about the dormitory will be assessed to the one occupying the room, or to the whole body of dormitory students if the responsible parties are unknown.

College Regulations.

Each student is expected to maintain a grade of 70, on a scale with 100 as perfect. Any student who fails to maintain this grade will be reported to the faculty by the professor in charge of such study or labor. It is then the duty of the president to announce such failure publicly before the school, after which such student shall have two weeks in which to raise his grade; at the end of this time, if such student fail to raise his grade, he shall be suspended from the school unless sickness of the student or his friends interfere with his work or there be some other equally extenuating circumstance, when the rule shall be inoperative.

MEANS FOR INSTRUCTION AND ILLUSTRATION.

The college hall with chapel, drawing room, library and reading room, museum, and office of president and secretary, besides five recitation rooms, armory, rooms for storage, etc. The library of about 1,500 bound volumes, besides pamphlets, maps, magazines, papers, etc.

The chemical laboratory, with lecture room for forty students; also work or analytic room, with desks for twenty-four students, each desk being supplied with the water and gas for use of each student, and convenient hoods for ventilation; also, station laboratory with balance room, distillation room, etc.

The conservatory, 20x50 feet, with curve roof and 1,500 feet of glass, containing about 500 species or 10,000 plants, representing many interesting and rare botanical families; heated by improved hot water apparatus.

The orchards and grounds carefully laid out and planted to ornamental shrubs and trees, the planting of forestry and the propagating ground of the same, the kitchen garden, with its many varieties of vegetables and small fruits, hot beds and cold frames.

The mechanic shop, consisting of main building, 25 x56 feet, two stories in hight, with a rear portion 20x62 feet, of one story. The upper floorof the main building is fitted with benches for sixteen students in wood work; desks and tools for ten students in wood carving, four wood lathes, a scroll saw and an iron frame buzz saw. The lower floor contains an iron working room, with sixteen benches for working in filing, etc.; a speed lathe, two iron lathes with attachments, a shaper, and two drills for wide range of work. There is also an office and a wash room, besides a wide hall containing the twelve horse power engine, and from which rise the stairs to the floor above. The rear portion contains boiler and coal room, forge shop with six forges furnished with blast from a fine Sturdevant rotary blower, and a foundry room. The machinery and appliances are first-class in every respect.

The farm of 240 acres with a large part under cultivation, including the experimental ground of eight acres, containing twenty-five series of plats of seventeen in each series, each plat containing two square rods. The whole ground is surrounded and the plats divided by convenient walks and drives. In stock, we have Jersey cattle, Clydesdale horses and Berkshire swine.

Connected with the departments of physics and engineering we have two fine water meters and a full set of meteorological instruments; also, a full set of standard weights and measures recently prepared for each Agricultural college in the United States, according to joint resolution of congress to that effect; besides these we have apparatus for illustrating lectures on the various branches of the subject, especially hydraulics, which has so direct a bearing on the subject of division and flow of water.

The military department is supplied by the state with sixty stands of arms and accoutrements for practice in military drill.

The scientific department is supplied with a fine cabinet of specimens illustrating botany, entomology, geology and mineralogy, zoology and comparative anatomy.

The mathematical department is supplied with a good engineer's transit, a Wye level (15 inch), rods, chains, etc., for practical field work in surveying and engineering.

LOCATION.

Fort Collins, the site of the college, and the county seat of Larimer county, is a fine town of about 3,000 inhabitants, situated in the beautiful and fertile valley of the Cache-la-Poudre river, just as it emerges from the foot-hills which skirt the snowy range. Extended views of the foot hills and the ranges greet the eye, stretching away to the north and south, and culminating in Long's peak, with its twin points, which seem like sentinels to guard this portion of the range. In other directions lie fields of growing grain and alfalfa, and gardens of fruits and vegetables. For healthfulness, the location can not be surpassed. There are fewer and less disastrous storms and sudden changes than at any other point on the slope.

The town is having a thriving and steady growth, is well governed, and is taking an advanced position in regard to education and other matters of public import.

The college is situated at the south side of town on gently rising ground. It is connected with the city system of water works, by which good, pure water is furnished for all purposes. The various buildings are located on either side of the Colorado Central railroad, and front on College avenue, one of the finest residence avenues in the city.

The town is easily accessible from all parts of the state by means of the Colorado Central and the Greeley, Salt Lake & Pacific railroads, by which three trains arrive and depart daily, carrying passengers and mail.

HISTORY.

The State Agricultural college of Colorado, in common with those of other states, had its origin in an act of Congress, passed July 2, 1862, which granted 90,000 acres of land as an endowment fund for a college "where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in order to promote the *liberal* and *practical* education of the industrial classes in the *several pursuits* and *professions* of life."

No benefit was received from this grant until an act of Congress, passed April 24, 1884, confirmed it to the state. The land is now located, and a very small portion sold, the proceeds from which are to form a perpetual endowment fund.

The state has very generously supported the college by the passage of an act (1883), levying a tax of one-fifth of a mill annually on each dollar of valuation. This gives the college a steady endowment, but not much growth. It is to be hoped that future legislation will give necessary buildings and apparatus.

The college was incorporated by the act of 1870, and the act amended in 1872 and again in 1874, but no steps were taken toward the erection of a college, by the board in charge. In 1877, by death of the president of the board and removal of other members from the state, an emergency was declared to exist and a new law was passed which was given immediate effect. To the State Board of Agriculture, as thus reorganized, was entrusted the work of building a college.

The town of Fort Collins was selected as its site, and at a meeting held February 27, 1878, it was determined to erect a building suited to college purposes. The corner stone was laid July 29, 1878, and in the same year the first building was completed. The college was not opened for the reception of students until September 1, 1879. The dormitory was erected in 1881, and the chemical laboratory in 1882, but not thoroughly fitted for work until May, 1883.

A small propagating house was built in 1882, for the purpose of aiding Horticulture. The present greenhouse with its curvilinear roof and all modern appliances was completed September 1, 1883. On the same day the mechanic shop was completed, its machinery in order and ready to run.

The college now comprises the following distinct departments: Agriculture, Chemistry and Geology, Horticulture, Botany and Entomology, History, Literature and Modern Language, Mathematics and Military Science, Mechanics and Drawing, Physics and Engineering, and Veterinary Science and Zoology.

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CALENDAR.

1888-89.

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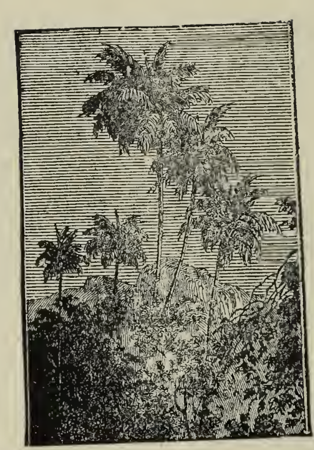


AGRICULTURAL
EXPERIMENT STATION.
6 1889
UNIVERSITY OF ILLINOIS.

REGISTER

OF THE

OFFICERS AND STUDENTS

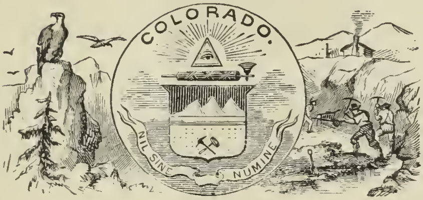
AND

COURSES OF INSTRUCTION

IN THE

State Agricultural College,

FORT COLLINS, COLORADO.



1888-89.

FORT COLLINS, COLORADO:
THE COURIER PRINTING & PUBLISHING HOUSE.
1889.

MEMBERS OF THE

STATE BOARD OF AGRICULTURE.

	Term Expires.
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Hon. John J. Ryan, Loveland,	1897
Hon. Frank J. Annis, Fort Collins,	1895
Hon. Charles H. Small, Pueblo,	1895
Hon. R. A. Southworth, Denver.	1893
Hon. George Wyman, Longmont,	1893
Hon. B. S. LaGrange, Greeley,	1891
Hon. W. F. Watrous, Fort Collins,	1891
His Excellency Gov. Job A. Cooper,	*Ex-officio.*
President Charles L. Ingersoll,	

OFFICERS OF THE STATE BOARD.

Hon. George Wyman,	President
Hon. Frank J. Annis,	Secretary
Hon. Wm. H. Brisbane, State Treasurer, (*ex-officio*)	Treasurer

COMMITTEES.

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B. S. LaGrange, C. H. Small, W. F. Watrous.

EXPERIMENT STATION AND SCIENTIFIC EXPERIMENT.

F. J. Annis, C. L. Ingersoll, R. A. Southworth.

FARM.

B. S. LaGrange, R. A. Southworth, J. J. Ryan.

FINANCE.

J. J. Ryan, W. F. Watrous, C. H. Small.

FACULTY, TEXT-BOOKS AND COURSE OF STUDY.

C. L. Ingersoll, F. J. Annis, R. A. Southworth.

HORTICULTURE.

W. F. Watrous, A. L. Emigh, F. J. Annis.

MATHEMATICS AND ENGINEERING.

A. L. Emigh, B. S. LaGrange. R. A. Southworth.

MECHANICS AND CHEMISTRY

C. H. Small, F. J. Annis, W. F. Watrous.

VETERINARY SCIENCE AND STOCK.

R. A. Southworth, A. L. Emigh, J. J. Ryan.

FACULTY OF INSTRUCTION.

CHARLES L. INGERSOLL, M. S.,
President, Professor of Political Economy and Logic.

AINSWORTH E. BLOUNT, A. M.,
Professor of Agriculture.

JAMES CASSIDY, M. S.,
Professor of Botany and Horticulture.

JAMES W. LAWRENCE,
Professor of Mechanics and Drawing.

VASA E. STOLBRAND,
Professor of Mathematics.

MAUD BELL,
Professor of History, Literature and Modern Language.

DAVID O'BRINE, E. M., D. Sc., M. D.,
Professor of Chemistry and Geology.

LOUIS G. CARPENTER, M. S.,
Professor of Physics and Engineering.

WILLIAM McEACHRAN, M. D., V. S.,
Professor of Biology.

WARREN H. COWLES, 1st Lieut. 16th Infantry, U. S. A.,
Professor of Military Science and Tactics.

GRACE PATTON, B. S.,
Instructor in College.

FRANK J. ANNIS, M. S.,
Secretary.

REGISTER OF STUDENTS.

1888-89.

POST GRADUATES.

Coffin, Lewis A., B. S.,	Longmont,	Colo.

SENIOR CLASS.

Bell, Lucy,	Chester,	N. H.
Davis, Arthur L.,	Arvada,	Colo.

JUNIOR CLASS.

Benson, Clarence V.,	Loveland,	Colo.
Benson, Vellie V.,	"	"
Buffum, Burt C.,	Fort Collins,	"
Duncan, Charles A.,	Timnath,	"
Garbutt, Newton C.,	Laporte,	"
Lunn, Nellie E.,	Fort Collins,	"
Temple, Harry R.,	Chico Springs,	N. M.
Thoman, Cora B.,	Fort Collins,	Colo.

SOPHOMORE CLASS.

Calkins, John S.,	Semper,	Colo.
DeVotie, Frank,	Greeley,	"
Elton, Carrie I.,	Fort Collins,	"
Evans, Charles R.,	"	"
Hankins, Ulysses S.,	Loveland,	"
Jordan, William H.,	Pueblo,	"

Kern, John W.,	New Windsor,	Colo.
Loomis, Guy,	Fort Collins,	"
Marshall, Edward T.,	Denver,	"
McClelland, Henri S.,	Fort Collins,	"
McClelland, J. Horace,	"	"
McLain, Minnie E.,	Timnath,	"
Rettberg, Otto T.,	Pueblo,	"
Stratton, Sophy,	Fort Collins,	"
Sturdevant, H. Arthur,	"	"
Woods, George D.,	"	"

FRESHMAN CLASS.

Atwood, Joseph T.,	Longmont,	Colo.
Baker, Willis A.,	Jefferson,	"
Beach, Charles W.,	Julesburg,	"
Beach Frank,	"	"
Bell, Alice,	Chester,	N. H.
Bell, Samuel,	"	"
Bristol, Bertha M.,	Fort Collins,	Colo.
Buffum, George H.,	"	"
Galucia, Amy L..	Buckhorn,	"
Howard, Bertram K.,	Fort Collins,	"
Lapham, B. Archie,	Sedalia,	"
Lee, Kate E.,	Fort Collins,	"
Lines, Celia,	Platteville,	"
Lines, Jennie,	"	"
Livingston, Frank N.,	Fort Collins,	"
Livingston, Howard J.,	"	"
Masterson, Mary C.	Golden,	"
McGee, Edward,	Leadville,	"
Naylor, Dora A.,	Loveland,	"
Nelson, John R.,	Fort Collins,	"
Peebles, Frank N.,	Satank,	"
Prendergast, Wilfred,	Fort Collins,	"
Purcell, Mary J.,	Fort Collins,	"

Rand, Louisa,	Arvada,	Colo.
Ratcliff, Richard,	Sedalia,	“
Rogers, Frank A.,	Golden,	“
Silcott, Ada,	Fort Collins,	“
Stimson, Lewis E.,	North Platte,	Neb.
Suiter, Henry W.,	Fort Collins,	Colo.
Thompson, Frank H.,	Castle Rock,	“
Williams, Harry F.,	Greenland,	“
Woods, Herbert I.,	Fort Collins,	“

PREPARATORY CLASS.

Anderson, William O.,	Columbus,	Neb.
Bachelder, Ida A.,	Greeley,	Colo.
Brown, Adelbert,	Fort Collins,	“
Brown, Jesse J.,	Eddyville,	Iowa
Carmichael, Almet S.,	Brighton,	Colo.
Conway, Mitchell,	Cheyenne,	Wyo.
Cornell, Myrtle,	Fort Collins,	Colo.
Crosier, Lelon J.,	Jefferson,	“
Dorsey, George W.	Chico Springs,	N. M.
Duckworth, Willie A.,	Pueblo,	Colo.
Ellingson, Edgar,	Islay,	Wyo.
Gilkison, Charles J.,	Laporte,	Colo.
Gross, Fred W.,	Fort Collins,	“
Harrington, Minnie F.,	Bellevue,	“
Hill, Brook,	Pueblo,	“
Kendall, Herbert S.,	Fort Collins,	“
Kronig, Louis G.,	Watrous,	N. M.
Kugler, Joseph L.,	San Luis,	Colo.
Lee, Rose E.,	Fort Collins,	“
Lewis, Ida M.,	Timnath,	“
Marvin, Clinton J.,	Pueblo,	“
McCartney, Belle,	Jefferson,	“
McCartney, Ellen,	“	“
McCartney, Edwin W.,	“	“

McCartney, Horace,	Jefferson,	Colo.
McGee, William,	Leadville,	“
MacPhee, Angus,	Islay,	Wyo.
Meyer, Charles J.,	San Luis,	Colo.
Nelson, Alexander,	Fort Collins,	“
Picken, Mabel,	“	“
Ralph, William J.,	“	“
Saxton, Cora B.,	“	“
Sexton, William E.,	“	“
Silcott, Nora,	“	“
Sturdevant, J. Colin,	“	“
Swan, Sylvia G.,	“	“
Van Brunt, Mary,	“	“
Walter, Raymond,	“	“
Warren, Charles B.,	“	“
West, Leslie B.,	Golden,	“
Wing, J. Guy,	Fort Collins,	“

IRREGULAR AND SPECIAL STUDENTS.

Black, Almeda,	Fort Collins,	Colo.
Brown, Clarence R.,	“	“
Dwiggans, W. C.,	Newcastle,	“
Kinnison, Harry J.,	Fort Collins,	Colo.
Patton, Jesse,	“	“
Silcott, Lillie M.,	“	“
Vollintine, Mabel,	“	“

RECAPITULATION.

Post Graduate,	1
Senior Class,	2
Junior Class,	8
Sophomore,	16
Freshman Class,	32
Preparatory Class,	41
Irregular and Special Students,	7
Total	107

GRADUATES.

1884.

Libbie Coy, B. S., Fort Collins, Colo., - - - - Teacher
Leonidas Loomis, B. S., Green River City, Wyo., - Stockman
George H. Glover, B. S., D. V. M., Denver, Colo., - -
- - - - - Veterinary Inspector, Denver, Colorado

1885.

Cora B. Blinn, B. S., Berthoud, Colo., - - - - Teacher
Edna Hice, B. S., Fort Collins, Colo., - - - Teacher
Lelia Robertson, *nee* Loomis, Fort Collins Colo., - -
Grace Patton, B. S., Fort Collins, Colo., - - -
- - - - - Instructor at State Agricultural College
Robert E. Trimble, B. S., Fort Collins, Colo., - - - Merchant
Helen White, B. S., Fort Collins, Colo., - - - At Home

1886.

Wilbert J. Sickman, B. S., Fort Collins, Colo., - -
- - - - - - - Clerk of the County Court

1887.

Eleanor F. Gill, B. S., Fort Collins, Colo., - - - Teacher
Daisy E. Stratton, B. S., Fort Collins, Colo., - - - Teacher
Lerah G. Stratton, B. S., Fort Collins, Colo., - -
- - - - - Librarian, State Agricultural College
Edwin G. Nettleton, B. S., Nampa, Idaho, - Commission Merchant

1888.

Lewis A. Coffin, B. S., Fort Collins, Colo., - - -
- - - Assistant Chemist, State Agricultural College
Harvey H. Griffin, B. S., Del Norte, Colo., - - -
- - - In charge San Luis Valley Experiment Station
Josephine Lee, B. S., Fort Collins, Colo., - - - Teacher
Genevieve E. McLain, B. S., Timnath, Colo., - - Teacher

1889.

Lucy Bell, B. S., Fort Collins, Colo., - - - - At Home
Arthur L. Davis, B. S., Arvada, Colo., - - - Farmer

COLLEGE CADETS.

ROSTER OF BATTALION.

Warren H. Cowles, 1st Lieut. 16th Inf., U. S. A., Commandant.

"A" COMPANY.

OFFICERS.

Captain, Garbutt. N. C.,
1st Lieut., Buffum, B. C.,
2nd Lieut., Benson, C. V., (Acting Adjutant),
1st Sergeant, Calkins, J. S.,
Sergeant. DeVotie, F., (Acting Sergeant Major),
Sergeant, Loomis, G.,
" Hankins, U. S.,
Corporal, Jordan, W. H.,
" Thompson, F.,
" Nelson, J. R.,

PRIVATES —23.

Atwood, J. T.,
Beach, F.,
Brown, J. J.,
Buffum, G. H.,
Dorsey, G. W.,
Gross, F. W.,
Kendall, H. S.,
Kronig, L, G.,
Livingston, F. N.,
McGee, E.,
Meyer, C. J.,
Ralph, W, J.,
Sexton, W. E.,
Sturdevant, J. C.,
West, L. B.,
Wing, J. G.,
Hill, B.,
Prendergast, W.,
McClelland, J. H.,
McPhee, A.,
Duckworth, W. A.,
Gilkison, C. J.,
McCartney, E.,

"B" COMPANY.

OFFICERS.

Captain, Davis, A. L.,
1st Lieut., Temple H. R.,
2nd Lieut., McClelland, H. S.,
1st Sergeant, Duncan, C. A.,
Sergeant, Kern J.,
" Williams. H. F.,
" Woods, G. D.,
Corporal, Marshal, E. T.,
" Sturdevant, H. A.,
" Suiter, H. W.,
" Evans, C. R.

PRIVATES—23.

Anderson, W. O.,
Baker, W. A.,
Beach, C. W.,
Bell, S.,
Brown, C. R.,
Brown, A.,
Dwiggans, W. C.,
Carmichael, A. S.,
Crosier, L. J.
Howard, B. K.,
Kugler, J. L.,
Lapham, B. A.,
Livingston, H. J.,
McCartney, H.,
McGee, W.,
Nelson, J.,
Peebles, F. N.,
Ratcliff, R.,
Rettberg, O. T.,
Stimson, L. E.,
Warren, C. B.,
Walter, R.,
Woods, H. I.

COURSE OF STUDY.

PREPARATORY YEAR.

FIRST TERM.

Arithmetic,	Sanford's Analytic
Elocution,	Fenno
Word Analysis,	Swinton

Labor, two hours, farm.

SECOND TERM.

Arithmetic,	Sanford's Analytic
English Analysis,	Kellogg
U. S. History,	Johnston

Labor, two hours, shop practice.

THIRD TERM.

Arithmetic,	Sanford's Analytic
Physical Geography,	Houston
English Analysis,	Kellogg

Labor, two hours, garden.

Composition, one exercise each week,	Swinton

Military drill, four exercises each week.

FRESHMAN YEAR.

FIRST TERM.

Algebra,	Olney
History,	Swinton
Botany,	Gray

Labor, two hours, garden.

SECOND TERM.

Algebra,	Olney
History,	Swinton
Bookkeeping,	Meservey

Labor, two hours, shop practice.

THIRD TERM.

Algebra,	Olney
English Literature,	Kellogg
Botany,	Gray, with Coulter's Flora

Labor, two hours, farm.

Composition and Rhetoric, one exercise a week.

Military Drill, four exercises a week.

SOPHOMORE YEAR.

FIRST TERM.

Geometry,	Wentworth
Chemistry,	Norton
Literature,	Kellogg

Labor, two hours, laboratory practice.

SECOND TERM.

Geometry, nine weeks,	Wentworth
Trigonometry, three weeks,	Wentworth
Chemistry,	Norton
Physiology,	Lectures

Labor, two hours, laboratory practice.

THIRD TERM.

Trigonometry, three weeks,	Wentworth
Surveying, six weeks,	Davies
Hydraulics,	Lectures
Rhetoric,	D. J. Hill

Labor, two hours, field surveys, etc.

Civil Government and Constitution, one exercise a week.

Military drill, four exercises a week.

The Course from this point is separated into:

1. The Agricultural Course.
2. The Mechanical Course.

AGRICULTURAL COURSE.

JUNIOR YEAR.

FIRST TERM.

Physics, Canal Work, Hydraulics,	Deschanel
Zoology,	Packard
Stock and Dairying,	Lectures

Labor, two hours, botanical laboratory.

SECOND TERM.

Physics,	Deschanel
Geology,	LeConte
Agricultural Chemistry,	Storer

Labor, two hours, chemical laboratory.

THIRD TERM.

Physics,	Deschanel
Entomology,	Packard
Agriculture,	Lectures

Labor, biological laboratory, two hours.

Analytic Geometry and Conic Sections, one exercise a week.

Military Drill, four exercises a week.

AGRICULTURAL COURSE.

SENIOR YEAR.

FIRST TERM.

Psychology,	Porter
Landscape Gardening,	Kemp
Agriculture,	Lectures

Labor, two hours, farm, five exercises a week.

SECOND TERM.

Logic,	Fowler
Horticulture,	Lectures
Astronomy, six weeks,	
Meteorology, six weeks,	

Labor, two hours, shop, three exercises a week.
Garden; two exercises a week.

THIRD TERM.

Political Economy,	Wayland-Chapin, and Lectures
Horticulture,	Lectures
Veterinary Science,	Lectures

Labor, two hours, garden, five exercises a week.
Military Drill, five exercises a week.

MECHANICAL COURSE.

JUNIOR YEAR.

FIRST TERM.

Physics,	Deschanel
Zoology,	Packard
Drawing,	Lectures and Practice
German,	Cook's Otto's Grammar

Labor, two hours, shop practice.

SECOND TERM.

Physics,	Deschanel
Geology,	LeConte
Drawing,	Lectures and Practice
German,	Cook's Otto's Grammar

Labor, two hours, shop practice.

THIRD TERM.

Physics,	Deschanel
Entomology,	Packard
Drawing,	Lectures and Practice
German,	Cook's Otto's Grammar

Labor, two hours, shop practice.

Analytic Geometry and Conic Sections, one exercise a week.

Military Drill, four exercises a week.

MECHANICAL COURSE.

SENIOR YEAR.

FIRST TERM.

Psychology,	Porter
Landscape Gardening,	Kemp
The Steam Engine,	Lectures
German,	Cook's Otto's Grammar

Labor, two hours, shop practice.

SECOND TERM.

Logic,	Fowler
Horticulture,	Lectures
Transmission of Power,.	Lectures
German,	Cook's Otto's Grammar

Labor, two hours, shop practice.

THIRD TERM.

Political Economy,	Wayland-Chapin
Horticulture,	Lectures
Study of Special Machines,	Lectures
German,	Cook's Otto's Grammar

Labor, two hours, shop practice.

Military Drill, five exercises a week.

RECITATION SCHEME—FALL TERM.

TIME.	PREPARATORY.	FRESHMAN.	SOPHOMORE.	JUNIOR.	SENIOR.
8 a. m.	....	....	....	Drawing.	German.
8:45 a. m.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.
9 a. m.	Word Analysis.	History.	Geometry.	Physics.	Landscape Gardening
9:50 a. m.	Elocution.	Algebra.	Literature.	Zoology	Agriculture. The Steam Engine
10:40 a. m.	Arithmetic.	Botany.	Chemistry	Stock and Dairying. German.	Psychology.
Four Days, 11:30 a. m.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing Military Drill.	Free Hand Drawing. Military Drill.
Friday.	Composition.	Rhetoric.	Civil Government.	Analytic Geometry.	Military Science.
1:30 p. m. to 3:30 p. m.	Labor, Farm, 5 days.	Labor, Garden, 5 days.	Labor, Chemical Laboratory practice, 5 days.	Labor, Botanical Laboratory, and Shop practice, 5 days.	Labor, Farm and Shop practice, 5 days.

RECITATION SCHEME—WINTER TERM.

TIME.	PREPARATORY.	FRESHMAN.	SOPHOMORE.	JUNIOR.	SENIOR.
8:45 a. m.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students	General Assembly of Students.	General Assembly of Students.
9 a. m.	Arithmetic.	History.	Chemistry.	Physics.	Horticulture.
9:50 a. m.	English Analysis.	Algebra.	Physiology.	Geology.	Transmission of Power. Astronomy, 6 weeks. Meteorology, 6 weeks.
10:40 a. m.	U. S. History.	Bookkeeping.	Geometery, 9 weeks. Trigonometry, 3 weeks	Agricultural Chemistry. German.	Logic.
Four Days, 11:30 a. m.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.
Friday.	Composition.	Rhetoric.	Civil Government.	Analytic Geometry.	Military Science.
1:15 p. m. to 3:15 p. m.	Labor, Shop practice, 5 days.	Labor, Shop practice, 5 days.	Labor, Chemical Laboratory practice, 5 days.	Labor, Chemical Laboratory and Shop practice, 5 hours.	German, 2:15 p. m.
3:15 p. m. to 5:15 p. m.	Labor, Shop practice, 5 days.	Labor, Shop practice, 5 days.	....	....	Labor, Garden, 2 days. Shop practice, 3 and 5.

RECITATION SCHEME—SPRING TERM.

TIME.	PREPARATORY.	FRESHMAN.	SOPHOMORE.	JUNIOR.	SENIOR.
8 a. m.	....	....	....	Drawing.	German.
8:45 a. m.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.
9 a. m.	English Analysis.	Algebra.	Rhetoric.	Physics.	Horticulture.
9:50 a. m.	Arithmetic.	Literature.	Hydraulics.	Entomology.	Political Economy.
10:40 a. m.	Physical Geography.	Botany.	Trigonometry, 3 weeks. Surveying, 6 weeks.	Agriculture. German.	Special Machines. Veterinary Science.
Four Days, 11:30 a. m.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.
Friday.	Composition.	Rhetoric.	Civil Government.	Analytic Geometry.	Military Science.
1:30 p. m. to 3:30 p. m.	Labor, Garden, 5 days.	Labor, Farm, 5 days.	Labor, Surveying, 5 days.	Labor, Biological Laboratory practice, 5 days. Shop practice, 5 days.	Labor, Garden, 5 days. Shop practice, 5 days.

DEPARTMENTS OF

INSTRUCTION AND LABOR.

AGRICULTURE.

This study is begun by a course of lectures in the first term of the Junior year, in which are discussed the various breeds of horses, cattle, sheep, swine and poultry; their history, adaptation, etc., etc., together with improved methods.

In the third term the following subjects are considered, viz: The preparation of the soil, seeding, harvesting, threshing, marketing, farmyard manures, their application and utility; irrigation and its application; also, the principles of stock feeding for flesh and other products are examined.

In the first term of the Senior year, the course is continued by lectures on rotation of crops, farm drainage, implements, cereals, and their improvement by selection, crossing and care; also, the careful employment and superintendence of labor.

The students are required by law to labor on the farm and experimental grounds two hours each school day, of one term in each of the first two years of the course, and in part of the Senior year.

" Labor and study, theory and practice go hand in hand. To know how and when to do work well is a science; to acquire, skill. That they may obtain the science, study is necessary; to get the art, work is indispensable."

BIOLOGY.

The chair of Biology includes the studies of Veterinary Science, Physiology, Zoology and Entomology.

VETERINARY SCIENCE.

This branch of study is taken up in the Senior year, and runs through the third term, lectures on the anatomy and diseases of domestic animals, with special attention to veterinary sanitary science being given, which are illustrated by skeletons, dissections, plates and models. The subject of animal histology forms a feature in this course, the students being instructed in the use of the microscope, and in the preparation, cutting, staining and mounting of sections of the different organs and tissues of the animal body. The laboratory is fitted with Beck's Economic microscopes (furnished with two eye pieces, and $\frac{1}{2}$ and $\frac{1}{6}$ objectives, giving a magnifying power of from 60 to 600 diameters), and other necessary apparatus for the best scientific work in this direction.

PHYSIOLOGY

forms part of the work of the Sophomore year, and runs through the second term. It consists of a course of lectures in the physiology and hygiene of the human body, illustrated by demonstrations, models and plates.

ZOOLOGY.

This branch of comparative study is taken up in the first term of the Junior year. Packard's Zoology, briefer course, is used as a text book, and is supplemented by lectures and laboratory work, which consists of dissections, drawings and classification of the animal world. The facilities for this work are now excellent, as the College possesses a complete set of both marine and inland fauna, to which additions are constantly being made, both by purchase and as the work of students.

ENTOMOLOGY

is taken up in the third term of the Junior year. Packard's Entomology for beginners, being used as a text book. The course will consist of recitations, supplemented by collections of insects, which will be studied in the laboratory, classified and mounted. The collections made by each class will become part of the College museum.

The laboratory is fitted with Bausch and Lomb's dissecting microscopes, and all other apparatus necessary to scientific investigation, including breeding cages for insects, in which the students can observe the habits and metamorphosis of these interesting creatures.

BOTANY.

The study of Botany begins in the first term of the Freshman year, in which the organs of plants, their physiology and anatomy are briefly considered. During a portion of this term a number of flowers are analyzed, and a few plants collected and prepared for the herbarium.

In the Spring term of the same year, students study plants systematically, and learn to become familiar with the leading natural orders.

The terms used in descriptive Botany are studied in this connection, so that each student may understand the methods of determining the scientific names of plants.

Each student is required to make drawings, with descriptions of plants studied.

ADVANCED BOTANY.

In the second term of the Junior year, vegetable physiology and the minute structure of plants, including the modifications of the vegetable cell, its products and the various kinds of tissue in plants, are fully considered.

A portion of this term is devoted to cryptogamic botany, especially the moulds, rusts, smuts and mildews, so destructive to useful plants.

Students have the use of compound microscopes, and work two hours daily in the botanical laboratory.

An herbarium of native and foreign plants and a large greenhouse furnish material for study.

Books of reference—Gray and Coulter, Gray's Botanical Text Book, Vol. I., Goodale's Vegetable Anatomy and Physiology, Sachs, Lesquereux, Bessey, Cook, Darwin and others.

HORTICULTURE.

Instruction in the several branches of Horticulture is given as follows: In practical Floriculture, by lectures upon such topics as the construction, heating and management of greenhouses; the propagation of plants by seed, cutting, layers, budding and grafting; how budding and grafting are performed, and their uses; the cultivation and general management of greenhouse plants for commercial or private purposes; insects and diseases of plants under glass, with remedies therefor; parlor gardening, Wardian cases and ferneries; arrangement of flowers in bouquets and floral designs.

Instruction in Pomology is given by lectures, and embraces a theoretical and practical study of the propagation, planting, pruning and general management of orchards and small fruit gardens; insect enemies, diseases and varieties best adapted to this latitude; classification of fruits by form; habit of growth; flowers and leaves.

Vegetable culture comprises kitchen and market gardening, and seed growing, and the principal topics considered are: The best situation for, and the laying out of, the garden with a view to its irrigation, and most econom-

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ical management in the rotation and planting of crops for the family and for market; management of composts and commercial fertilizers; care of tools; selection and growing of seeds; construction, management and uses of hotbeds and cold-frames; harvesting, marketing and storing of fruits and vegetables.

Forestry is taught by lecture, special attention being given to such topics as the value of trees and shrubs for timber and ornaments, for hedges, screens and shelter best for this State; the best methods of culture, with a history of varieties, especially such as are thought worthy of trial in this latitude.

Landscape gardening is taught in the Senior year by regular study of text book: Kemp's "How to Lay Out a Garden," and lectures, adapted as much as possible to the exigencies of this climate, frequent use being made of the grounds and their planting for illustration. The orchards, nursery, greenhouse, vegetable garden and flower garden afford ample opportunity to the students to acquire a practical acquaintance with the above topics. Each student, before completing the study, must complete a formal plat, arranged with reference to the best principles of the art.

CHEMISTRY.

It is the object of this department to give the student an opportunity to acquire a thorough mastery of the elementary principles of chemical science. To attain this object, theory and practice are made to go hand in hand. In the first term of the Sophomore year, the class listens to a series of lectures upon the general theory of the science, its history and development. In this course of lectures are discussed the subjects of acids, bases and salts, and the principles of chemical philosophy. The natural history, chemical and physical properties of each of the elements are discussed in detail, the whole being illustrated by numerous experiments. While taking this course, the student spends two hours each day in the chemical laboratory, repeating the experiments shown in the class room, and others which may be suggested, thus serving to familiarize the student with the various forms of compounds, the marked distinctions between the different classes of salts, the use of chemical nomenclature, and the manipulation of apparatus. Practice in the use of the blow pipe accompanies this work, and an insight into determinative minerology is thus acquired. The use and application of the spectroscope is also taught. The students in the laboratory at the end of the first term are examined by *unknown bodies* in the dry way. In the second term of the Sophomore year there is given a course of lectures on Organic and Applied Chemistry, one hour daily. The laboratory work continues during the term, and the student takes up the tests for the bases and their separation; also, the tests for the acids and their separation. The students are examined at the close of the second term by unknown bodies, mixtures of the several groups of bases and acids; finishing the work of qualitative analysis in the wet and dry ways.

In the second term of the Junior year, the student listens to a course of lectures upon Agricultural Chemistry, in which are discussed such subjects as the following: Relation of chemistry to agriculture; the literature of agricultural chemistry; elements of plant growth, their relative abundance and importance; the atmosphere, the soil, fertilizers, etc. During this term the class spends two hours daily in the laboratory, when the students pursue the study of quantitative analysis, both volumetric and gravimetric, and will also be directed in any line of special work they may desire. He will have an opportunity to see in the Station laboratory the analysis of food, blood, poisons, urine, water, coal, minerals, soils, assaying and gas analysis. Keeping in mind the object for which our College is founded, we have so planned our Chemical Course as to prepare the student for the general application of chemistry in relation to the industrial arts, while seeking to thoroughly ground him in the application of the science to agriculture. A new chemical laboratory, fitted up with all the modern appliances, is ready for the classes. Text books are Norton's Chemistry, O'Brine's Laboratory Guide and Storer's Agriculture. Beside the current chemical literature, the following books of reference are accessible to the students of this department: Watt's Dictionary of Chemistry, the works of Roscoe, Schorlemmer, Bloxam, Tidy, Miller, Stricker, Pinney, Fowne, Wagner; in analysis, the works of Fresenius, Wills, Classen, Prescott, Thorpe, Wohler, Crooke's Select Methods, Allen's Organic Analysis, Hart, Sutton, Blythe, etc.

GEOLOGY.

Recognizing the fact that Chemistry and Geology are the foundations of agricultural science, the subject of Geology receives corresponding attention. The second term of the Junior year, LeConte's Elements of Geology is taken up and continued during the year. The students work two hours each day in the laboratory. Lectures on Economic Geology are also given, using William's Manual as a guide. Frequent visits to the mountains and quarries illustrate the practical application of dip, strike, fault, formations, stratifications, and elevations by barometer, thermometer and level, whenever field work is practicable. At the end of the third term the students are required to identify and describe twenty-five rocks or mineral specimens.

The following works of reference are accessible to the students: Croll, Bischof, Lyell, Dana, Nicholson, Geikie, Von Cotta, Platner, Brush, Elderhorst and the geological reports of other States.

Any donations to these departments will be thankfully received and due credit given in the catalogue.

HISTORY, LITERATURE AND LANGUAGE.

HISTORY AND LITERATURE.

During the first two terms of the Freshman year, Swinton's Outlines of the World's History is studied, and the work is supplemented by lectures. During each of these two terms, each pupil is required to write an essay upon some historical period or subject. He thus acquires a good general knowledge of history, with an exact knowledge of some special period or historical subject. This method is designed to arouse a taste for pursuing the study of history in after life.

The last term of the Freshman year and the first term of the Sophomore year are devoted to English Literature, with critical readings of selected authors, and special attention to the writings of the five great English poets, and to the works of American writers. Each student is expected to select the works of some great author for special reading during each term. A careful oversight of all outside reading is attempted, and every effort is used to promote a taste for good literature.

ENGLISH.

The study is begun as a review of English Analysis, and continued by the study of Word Analysis in the Preparatory year. During the entire Preparatory year, the class studies Swinton's Composition, devoting special attention to punctuation, capitalization, the arrangement and structure of sentences, and the fundamental principles of style.

During the entire Freshman year the subject of English Composition is continued, with Kellogg's Rhetoric for a text book. The student gives attention to the subject of style and is made familiar with good English. It is the object of this work to give the student ability to write a clear, neatly arranged letter, properly spelled, punctuated and composed, and to give him some skill in the logical arrangement of his written thoughts.

During this two years' course in English, the student writes a composition each week.

During the Spring term of the Sophomore year, the study of the English Language is continued by the study of D. J. Hill's Rhetoric.

GERMAN.

German is studied during the Junior and Senior years. The great increase of the German population in America during the last thirty years has made a practical knowledge of the German language a business commodity as well as an elegant accomplishment. A course of two years in German is not sufficient to give a mastery of the language, but the limited time of study is occupied in giving, as far as possible, power to converse in every day life. The recitations are conducted in the language studied, and much stress is placed upon the ability to converse as the most certain way to read and use German effectively. It is thought that the study of some language besides his own is of great assistance to the pupil as a means of mental growth. During the Junior year, Worman's First and Second German books are used, and Andersen's Selected Fairy Tales, with frequent additional exercises in German grammar and composition. During the last year the time is equally divided between technical and literary German. A play from Schiller and selection from Faust are read, with practice in reading at sight, and the study of some German scientific work is also pursued.

MATHEMATICS.

The instruction offered by this department is designed to conform to the general aim and purpose of the institution; accordingly, only those branches of pure mathematics are taught which bear directly upon the curriculum, and which are a necessity in the every day life and business of the well-rounded business man.

Withal, the course as pursued is very nearly equal, by subjects, to that pursued in the ordinary classical course of Eastern colleges, but is less in detail, while the attention given to the applied mathematics, including surveying and irrigation canal engineering, is much greater.

ARITHMETIC.

Students pursue during the Preparatory year, the subject of Arithmetic; the first and second terms being devoted exclusively to decimal notation and analysis; the third term to the shorter, practical methods of commercial operations.

ALGEBRA.

The study of Algebra is begun in the first term of the Freshman year, and runs through that year. The first term is devoted mainly to the fundamental principles and operations governing the literal notation and factoring, the endeavor being to so thoroughly ground the student that the succeeding operations may be more of an unfolding process than a task and revelation.

The second and third terms' work is devoted to the study of Algebra proper, the Quadratic Equations, and so much more as the ability of the average class will allow.

GEOMETRY.

Geometry is placed in the first term Sophomore and nine weeks of the second term. Problems in Mensuration and original exercises will be added to the routine text book work, giving the student frequent practice in the application of principles already acquired, and fixing firmly the knowledge gained.

TRIGONOMETRY

occupies the last three weeks of the second term Sophomore, and the first three weeks of the third term. Plane Trigonometry, occupying a more practical place in the general run of business, is the only part taught. Thus, six weeks has been considered sufficient, since it is followed in the remaining six weeks of the term by its congener, Surveying, which, besides a fair share of field work, includes the theory, use and adjustment of the instrument; the history and practice of the U. S. Land Surveys; and mapping some plat, the notes of which are entirely the work of the class in the field.

Analytic, or General Geometry, occupies the entire Junior year in a weekly recitation. The object at present is merely to give the student such idea of this study as will enable him to understand and use the ordinary curves of Hydraulics and Astronomy. Thus plane Loci and applications thereunder are about the extent of the subject handled.

PRACTICAL MECHANICS.

The old system of apprenticeship is rapidly becoming a thing of the past, and it is now almost impossible for a boy to learn a trade in any modern shop or factory. This is owing largely to the introduction of special machinery, necessitating special workmen to manage it, and the workman who has learned to run a machine of this kind is kept at that work, as being most profitable to his employer. His practical knowledge of other methods and machines is, therefore, confined to narrow limits, and should a vacancy occur in a superior position, he is not fitted for the place, from the fact of his being unacquainted with other practical parts connected with his trade, the manipulations and principles involved in which he has not had an opportunity to learn.

This department has for its object a systematic and progressive education in the use of tools and materials, combined with as much theoretical knowledge as shall be deemed necessary to explain the principles involved. It does not teach special trades, nor manufacture salable articles; to do so would require that the student be kept on the kind of work he could do best, and thus prevent him from acquiring broad and liberal ideas of other methods. So, without teaching any one complete trade, the mechanical principles of many are gained. This does not necessarily mean that the student becomes sufficiently expert to compete with the skilled mechanic, but that a knowledge of *how* a tool or machine should be used, and the manner of *laying out work* for the same is thoroughly taught.

Should the circumstances be such that the student enter manufacturing, his ideas having been broadened by this training, he will the more readily grasp anything new that may come up in his business, or, if he take up farming, he will, with greater ease, be able to understand the mechanical principles and workings of his machinery, and also how to keep it and his buildings in proper repair.

The shop instruction will be divided into courses as follows, and in each course will be given, in connection with the work, an explanation of the construction of each tool, and its manner of acting on the material, the methods of determining how to select materials best suited to different kinds of work, the manner of laying out work, cutting speed of tools, etc.

COURSE OF LABOR.

FIRST YEAR.

Bench work in wood, ...	14	weeks
Machine work in wood, ...	4	“
Pattern making, ...	12	“
Vise work in iron, ...	10	“

SECOND YEAR.

Iron forging,	14	weeks
Steel forging,	4	"
Machine work in iron,	20	"

BENCH WORK IN WOOD.

This course consists of exercises with the different wood working bench tools, so arranged in a graded series as to embrace the manipulation of the tools in their various applications.

First—The use of planes in joining, smoothing and getting the piece out of wind, lining off, and the use of saws in cutting across and with the grain, and keeping to line.

Second—Halved splice.
Third—Splayed splice.
Fourth—Keyed splice.
Fifth—Open dovetail mortise and tenon joint.
Sixth—Mortise and tenon joint.
Seventh—Open dovetail joint.
Eighth—Blind dovetail joint.
Ninth—Lap joint.
Tenth—Dowel joint.
Eleventh—Small newel post with hand-worked rail.
Twelfth—Panel door.
Thirteenth—Roof truss.
Fourteenth—Box.
Fifteenth—Carpenter's trestle.

MACHINE WORK IN WOOD.

In connection with this course, with the use of tools, will be given the most rapid and economical method of selecting and preparing the wood for the machine. There will be given examples of

First—Straight turning.
Second—Cutting in and squaring off.
Third—Convex, concave and compound curves.

Fourth—Handles for chisels and other tools.

Fifth—Examples in chuck work in separate and combined pieces.

Sixth—How to turn a ball.

PATTERN MAKING AND FOUNDRY WORK.

After becoming familiar with bench and machine work in wood, an application of both is made, by constructing patterns with due regard to shrinkage, draft, and the best method of constructing the pattern, so that it causes the least amount of trouble in the foundry. There will be given examples of

Plain work.
Core work.
Pully work.
Pipe work.
Gear work.
Core boxes, their use and construction.

Cutting speed of tools, and proper angle of cutting edge for different purposes and different metals.

Centering and straightening work.
Straight turning and squaring.
Boring.
Making and fitting joints.
Chuck work.
Screw cutting inside and outside.
Drilling, tapping and reaming.
Boring with boring bar and use of center rest.
Polishing and finishing.
Hand tool work.

DRAWING.

Free hand copy and dictation.
Free hand model and object drawing.
Light and shade.
Geometrical problems.

Orthographic and isometric projections, and projection of shadows.

Development and intersection of surfaces.

Wood carving, diaper, incised and relief.

Persons having parts of machines, patterns, small models or working drawings, may, if they choose, donate the same to the department, and thereby confer a great favor upon the College, and especially upon the department.

MILITARY SCIENCE.

For instruction in Military Tactics, the students are formed into companies. The system of instruction being that in use in the United States Army, is calculated to form the habit of prompt obedience, foster the natural martial instinct, and prepare the students, should necessity arise, to organize and drill a company or battalion of our National Militia.

The drill includes the school of the soldier, company and battalion in Infantry Tactics, supplemented by lectures on the art and science of war.

Military drill is required of each male student, unless excused for physical disability, or by special vote of the Faculty for good and satisfactory reasons. Each cadet is required to purchase a copy of the standard United States Infantry Tactics for study and reference; he is also to provide himself with a uniform, modeled somewhat after the uniform of the regular army; it is neat and durable, consists of blouse, pantaloons, cap and gloves, and costs about twenty dollars.

In the fall and spring terms a period of fifty minutes daily is devoted to outdoor maneuvers; during the winter when such exercises are impracticable, this time is devoted to recitations in Tactics and lectures. When possible, an encampment will be held at the close of each spring term for practical instruction in guard and field duty.

PHYSICS AND ENGINEERING.

Hydraulics will be taken up in the last term of the Sophomore year, and will be pursued, having in view its important applications to the problems of irrigation.

The laws of flow and methods of measurement of water, in open channels, over weirs and through orifices, and devices for obtaining a constant flow of water and for dividing water will be studied and discussed. Also, the elements of irrigation engineering, including location grade, cross section, proportioning of embankments, reservoir and reservoir construction, etc., will be given.

Instruction will be given by lectures. In the afternoons opportunity will be given for field work in application of the class room instruction.

A collection of photographs and plans of irrigation construction will materially assist in illustrating the points discussed.

The following works are among those accessible:

State Engineer's Reports of Colorado and California; Moncrieff, Irrigation in Southern Europe; Baird Smith, Italian Irrigation; Buckley's Irrigation Works of India; Buffon, Canaux d'Irrigation de l'Italie, Septentrionale; Buffon, Hydraulique Agricole; Frances Lowell, Hydraulic Experiments; Cunningham, Roorkee Hydraulic Experiments; Darcy and Bazin, Recherches Hydrauliques; Lesbors, Experiences Hydrauliques; Fanning, Hydraulic Engineering; Rankin, Civil Engineering; Jackson, Hydraulic Manual; Neville's Hydraulic Tables; Beardmore's Hydrology; Bowser's Hydro-Mechanics; Graeff, Traite d'Hydraulique, etc.

The department invites donations of plans and information of irrigation structures, as dams, flumes, headgates, reservoirs, etc.

The study of Physics, taking up the branches of Mechanics, Heat, Light, Sound, and Electricity and Magnetism, will continue through the three terms of the Junior year. Where possible, the topics discussed will be illustrated by apparatus and experiment. In the afternoons, the student will be given an opportunity to perform many of the experiments himself, and to construct philosophical instruments.

Meteorology will be taken up for six weeks during the second term of the Senior year, and will include a discussion of the instruments used in taking observations, barometry, thermometry, precipitation, the laws of storms and the elements of agricultural meteorology.

Astronomy is studied for the remaining six weeks of the same term. It will include a study of the earth in its relation to the rest of the solar system, the movements of the solar system and their causes and effects, the sun, stars and planets, nebulae, comets and meteorites, and some effort will be made by means of a good achromatic telescope to make some of the interesting forms visible.

THE EXPERIMENT STATION.

The Experiment Station, including the plant at the College and the sub-stations at Del Norte and Rocky Ford, comprises one department of the College.

It was created in accordance with the Hatch act, and its work arranged in conformity thereto.

Bulletins and reports are issued from time to time, any of which can be had upon application addressed to "The Experiment Station," Fort Collins, Colorado, as long as the editions last.

Seeds are also distributed of those raised at the Station, or which come into the hands of the Board of Agriculture from other sources. All applications for seeds should be addressed to the "Secretary of the Board of Agriculture," Fort Collins, Colorado. All cannot be supplied, as has been abundantly shown this year; but such seeds as we have, and in such quantities as to be of the most use to our many applicants, will be sent out, where, in our judgment, they will do the most good.

MENTAL AND MORAL SCIENCE.

These studies are pursued in the Senior year, in such a manner as to give a good outline in each, which the student is expected to fill in largely by supplementary readings. Porter's "Elements of Intellectual Science" is used as text book and guide.

LOGIC.

The study of this branch is considered of prime importance, as in the presentation of the inductive we find the method pursued for the advancement of science and the means of elimination of error from experiment. The term's work is equally divided between the inductive and deductive methods.

POLITICAL ECONOMY.

Wayland, lectures and discussions, are used. The short term only gives sufficient time to arouse an interest in the divisions of the subject, and its leading principles; the student is induced to read, to weigh carefully, and thus to act intelligently on the questions which interest us as a nation in our growth and increase of wealth.

CIVIL GOVERNMENT.

The study of the Constitution of the United States and of the State of Colorado both conjoin to make more broad the mind of the student and the better fit him to take his place among the citizens of this or other States. These, with other subjects relating to civics, will be given by a series of exercises continuing through the Sophomore year; and thus early in the College course do we strive to urge thought in the direction of good citizenship.

PUBLIC RHETORICALS.

Each student enrolled shall render at least one public rhetorical exercise each College term, unless excused by Faculty vote. These exercises shall consist of declamations and recitations for the younger classes, and original exercercises for the advanced students. The importance of these exercises to the student can scarcely be estimated, as every one should have a training which will enable him to present his views upon any question in public in an intelligent and pleasing manner.

DEGREE.

Upon those who complete the work of the course as laid down, in a good and satisfactory manner, the State Board of Agriculture, upon recommendation of the Faculty of Instruction, confer the degree of B. S. (Bachelor of Science). The fee for graduation is fixed at $10, without other public expense to the student.

The degree of M. S. (Master of Science), is conferred upon all graduates of the College in good standing, who have pursued thoroughly some line of work after graduation, and who submit on acceptable thesis on the same.

EXPENSES.

Matriculation (entrance fee, entitling the student to the privileges of full course)	$ 5 00
Incidental fee, per term	1 00
Board in Dormitory (including room rent, heat and light) per week (about cost)	3 35
Graduation fee	10 00
Tuition	Free
Uniform (approximately)	20 00

Washing averages about seventy-five cents per dozen; no laundry is connected with the College. The Board of Agriculture has assigned the Dormitory exclusively to the young men; hence young ladies seeking instruction here must find rooms and board in the city. Board can be obtained in private families at $4 to $6 a week, room rent included.

The rooms in the Dormitory are each furnished with bedstead and stove; *students must furnish all else,* including straw ticks or mattresses. The conditions of occupancy are:

1. Good conduct.
2. A care and preservation of property.
3. A willing and cheerful obedience of the rules governing that part of the College.

TOTAL EXPENSES.

As some persons are desirous of knowing just what it may cost to attend school for a year, the following summary of approximate cost is made:

Matriculation fee (paid once)	$ 5 00
Incidentals, three terms	3 00
Board, thirty-six weeks, at $3.35 per week	120 60
Washing (average), fifty cents per week	18 00
Books (approximately)	15 00
Total	$161 60

The uniform is not mentioned in this estimate, as it costs no more than a good suit of citizen's clothes, and, consequently, will not increase the expense.

In terms where the students labor on the farm and garden, their wages go to lessen their expenses, so that, with economy, an average of $150 will pay the yearly expenses of a student during the whole course, excluding clothing, traveling expenses and incidentals. The Sophomore and Junior years are a little more expensive than the others, as fees must be paid for use of chemicals and apparatus; also the terms when students work in the shop.

CHEMICAL FEES.

Sophomore year, first and second terms, $5.00 each	$10 00
Junior year, first and second terms	10 00
Total for chemical course	$20 00

SHOP FEE

A shop fee of $5 per term is charged to cover cost of material and breakage or damage of tools. A fee of $2 per term is charged for the course in wood carving.

ADVANCE PAYMENT.

All fees must be paid in advance, and a receipt obtained from the Secretary entitles the bearer to admission to the classes. Board must be paid monthly in advance to the steward in charge of the boarding hall, and no reduction is made, unless for absence of a full week at one time. In such case, one-half the time is allowed. An absence of two consecutive weeks, entitles one to full reduction of time. A student leaving before the end of the term has any excess or balance to his credit refunded to him on settlement.

MONEY NEEDED BY STUDENT ON ENTRANCE.

Matriculation fee	$ 5 00
Incidental fee	1 00
Board (advance four weeks)	13 00
Room rent (about)	1 00
Uniform	20 00
Furniture for room, from $8 to $11 (average)	10 00
Books	5 00
	$55 00
Incidentals for washing, etc	5 00
Total	$60 00

CONDITIONS OF ADMISSION.

The College admits students of both sexes. Candidates for admission must be fifteen years of age, and unless personally known, must give good references. They must also pass an examination in the common branches, viz.: Reading, writing, spelling, grammar, arithmetic and geography. The work of the Preparatory year is, in part, a thorough review of grammar and arithmetic, with the additional subjects of United States history, physical geography, elocution, word analysis and penmanship; consequently a candidate for admission to the Freshman class must pass an examination in these branches, and not receive conditions in more than two of them. In no case can one be conditioned in the study of arithmetic. Candidates for advanced classes or work must be examined on all previous work, or bring certificates of standing from schools having an equivalent grade of work.

EXAMINATIONS FOR ENTRANCE.

Examinations for admission to the Freshman class will be as follows:

In *Reading*, candidates must be able to read understandingly, and with proper accent and emphasis.

In *Writing* and *Orthography*, they must be able to write from dictation sentences from standard pieces of English literature, both prose and poetry, sufficient in number to test their qualifications in penmanship and orthography.

Candidates will also be required to pass examinations in *Arithmetic*, *Grammar*, *Word Analysis*, *U. S. History* and *Physical* and *Descriptive Geography*.

Specimen questions follow, so that candidates may gain an idea as to what will be required upon presenting themselves for entrance to the Freshman class.

Similarly thorough examinations will be made for admissson to higher classes in all subjects completed by them:

ARITHMETIC.

1. Explain clearly and accurately the objects of Arithmetic and the methods of writing and reading numbers, entire—fractional, compound or denominate.

2. Explain the operation of division of whole numbers—abstract and compound or denominate, giving rule with its reasons.

3. Explain nature of prime numbers and factors of a number, of a common divisor, greatest common divisor, and give rule, with its reasons, for obtaining it.

4. Explain nature of decimal fractions and give rule, with its reasons, for multiplication of.

5. Define terms, ratio and proportion. Give properties of the latter and the rule, with its reasons, for the statement and solution of questions in simple proportion or single rule of three.

6. Find value of $5\frac{3}{4}$ — 4 1-7 -|- 5-28 -:- $1\frac{1}{2}$ x $2\frac{1}{3}$.

7. Divide 7.58405 by 11.7. Express dividend, divisor and quotient in words.

8. Find number of bushels in a bin 10 ft. x 12 ft. x 5 ft. Number of gallons in a cubical cistern whose edge is 6 ft.

9. At what per cent. above cost must a man mark a book that he may take off ten per cent. of marked price and still have 10 per cent. profit.

10 Find principal that will amount to \$1,111.11 in 11 years at 11 per cent.

UNITED STATES HISTORY.

1. Name the earliest European settlements within the present limits of the United States, when, where and by whom made.

2. When did the settlements by other nations than

the English come under their dominion, and under that of the United States?

3. How many colonies were there originally in Massachusetts and Connecticut? When were they united?

4. In what wars were the colonies engaged before the Revolution?

5. What were the remote and immediate causes of the Revolution? When did war properly begin, and when, where and how did it end?

6. Give particulars of Arnold's treason. Who were the most prominent Generals in this war? Name most important battles.

7. The Constitution of the United States, why and when was it formed? When was it adopted by the last of the original thirteen, and what State was this?

8. Give names of Presidents of the United States in order, and give a leading event in administration of each one.

9. Which was the first new State to be admitted after 1789, and when? Which was the last, and when?

10. What was the Gadsden Purchase?

WORD ANALYSIS.

1. What is the object of Word Analysis?

2. Of what elements is the English Language made up?

3. Define Roots, Prefixes and Suffixes.

4. What can you say of the Latin elements,
Greek,
Anglo Saxon, } in our language?
Other elements

5. What meaning is attached to the Prefixes and Suffixes?

6. Meaning of Etymology as used in Word Analysis?

7. Meaning of primitive, derivative, simple and compound words?

8. From what parts of speech do the roots of derivatives come?

GRAMMAR.

1. English Grammar teaches the use, knowledge and science of what?

2. What are the parts of speech, and why so called?

3. The office and use of each in the various positions they occupy in a sentence?

4. Define the different parts of a sentence, viz., principal parts, modifiers, phrases and clauses.

5. Define the modifications of a noun, viz., person, number, gender and case.

6 Define voice, mode and six tenses of the verb.

7. Name and define the pronouns, viz., personal, relative, interrogative and demonstrative.

8. What is comparison of adjectives and adverbs?

9. Define simple, compound and complex sentences.

10. Define a declarative, an interrogative, an imperative, an exclamatory, sentence.

DESCRIPTIVE GEOGRAPHY.

Questions will be asked upon the following topics:

GENERAL.

1. Definitions of divisions of the earth's surface, land and water, zones, latitude and longitude.

2. Location of large bodies of water.

3. Points with reference to important mountain chains.

4. Ditto in regard to islands.

5. Ditto in regard to rivers.

6. Ditto in regard to lakes.

SPECIFIC AND LOCAL—UNITED STATES.

7. The location and termini of important lines of communication by rail and water.

8. Boundary and location of selected States and groups of States.

9. Prominent geograpical features of the United States, as rivers, mountains, lakes and the like.

10. Names and locations of capitals and other important towns and cities.

PHYSICAL GEOGRAPHY.

1 Define Geography. How divided? Define each division.

2. Give dimensions of the earth and causes of revolution.

3. Discuss the Geological Ages

4. Give cause of volcanic eruptions. Where are the principal volcanic regions?

5. Discuss the mode of formation of coral islands.

6. Discuss drainage.

7. Explain the origin of winds; of land and sea breezes.

8. What are trade winds?

9. Give the origin of rocks. Classify them.

10. Explain cause of saltness of the ocean and inland seas

REGULAR AND SPECIAL COURSES.

Unless there seem to be strong and excellent reasons for it, students will not be allowed to take a special course of study, and in case it is allowed, the student must show that he is well qualified to pursue the studies selected by passing such examinations as the Faculty may assign. No student will be allowed to change his course during the progress of a term, nor will he be allowed to drop a study unless by permission of the Faculty.

LEAVING COLLEGE.

A student will not be allowed to leave College in term time without leave of absence granted by the President or Faculty, otherwise the student will be liable to *suspension* or *expulsion.* Temporary leave of absence can be granted by the President, or the officer in charge during his absence. Final separation from College must be acted upon by the Faculty.

LABOR.

The labor of students at the College is required by law; each student must labor two hours each school day, unless excused for physical disability. The labor at the College is of two classes: First, that which is performed solely for the purpose of instruction; second, that which is of some monetary value to the institution.

In the first class is placed all labor performed in chemical laboratory practice, in mechanic shop, in field surveying and leveling, and some labor in conservatory. In the second class is included all labor upon farm or garden, and extra time in the mechanic shop, when the student has acquired a sufficient degree of skill. The rate paid for labor of the second class varies with the skill and fidelity of the student. The maximum price is ten cents per hour. It is believed that the students of the Agricultural College or of any industrial school are able to accomplish as much in the line of study as if no labor were performed. At the same time, the labor helps to keep the physical nature strong and healthy, while the student, by learning well the principles of many trades and vocations, is made strong to grapple with the duties and responsibilities of life, while being educated to take his place among the best and most honored of our citizens of the future. The time that in many colleges is spent in revelry or athletic sports of questionable utility, is thus devoted to that which is not only a present benefit, by helping to support the student while in College, but gives him a ready means of support in many ways as soon as he leaves the College halls.

DISCIPLINE.

The discipline of the College is mild, but firm; the Faculty, however, reserve the right to suspend pupils with or without the knowledge of the parents, according to the circumstances of the case. Good conduct and effort is expected of all. When it becomes manifest from the deportment of any student that his presence is detrimental to the best interests of the school, either morally or otherwise, such student will be removed.

DORMITORY REGULATIONS.

Young men must obtain permission to be absent from the Dormitory any evening except Friday and Sunday. Study hours begin at 7 p. m. and close at 10 p. m. The time for retiring is fixed at 10:15 p. m.

Any marked violation of the above regulations will be followed by warning and advice; if still persisted in, the student will be suspended from the Dormitory, if not from the College. Students boarding outside must obtain permission before visiting the Dormitory. Damage to rooms or property about the Dormitory will be assessed to the one occupying the room, or to the whole body of Dormitory students if the responsible parties are unknown. Each student occupying a room must make a deposit of $2.50, to cover possible delinquencies, which sum must be maintained throughout the year. It will then be refunded, after all deductions are made.

COLLEGE REGULATIONS.

Each student is expected to maintain a grade of 60, on a scale with 100 as perfect. Any student who fails to maintain this grade will be reported to the Faculty by the Professor in charge of such study or labor, after which such student shall have two weeks in which to raise his grade; at the end of this time, if such student fail to raise his grade, he shall be suspended from the school, unless sickness of the student or his friends interfere with his work, or there be some other equally extenuating circumstance, when the rule shall be inoperative. A student is graded as passed in any study or branch of manual practice when the average of his daily progress and his term examination equals 65, on scale of 100 as perfect.

MEANS FOR

INSTRUCTION AND ILLUSTRATION.

The College hall, with chapel, drawing room, library and reading room, museum, and office of President and Secretary, besides five recitation rooms, armory, rooms for storage, etc. The library of about 1,500 bound volumes, besides pamphlets, maps, magazines, papers, etc.

The addition to the main building now in process of erection will give a fine assembly room, four large recitation rooms, with offices, cloak rooms, etc.; also a fine large armory for military drill and other department uses.

The Chemical Laboratory, with lecture room for forty students; also, work or analytic room, with desks for twenty-four students, each desk being supplied with the water and gas for use of each student, and convenient hoods for ventilation; also, Station Laboratory, with balance room, distillation room, etc.

The Botanical and Horticultural laboratory, now being constructed, with fine rooms for instruction and laboratory work, office, tool room, seed room, grafting room, and ample basement room for storage.

The Conservatory, 20x50 feet, with curve roof and 1,500 feet of glass, containing about 500 species, or 10,000 plants, representing many interesting and rare botanical families; heated by improved hot water apparatus.

The orchards and grounds carefully laid out and planted to ornamental shrubs and trees, the planting of forestry and the propagating ground of the same, the kitchen garden, with its many varieties of vegetables and small fruits, hot beds and cold frames.

The Mechanic Shop, consisting of main building, 25x 56 feet, two stories in height, with a rear portion 20x62 feet, of one story. The upper floor of the main building is fitted with benches for sixteen students in wood work; desks and tools for ten students in wood carving, four wood lathes, a scroll saw, a Fay jig saw and an iron frame buzz saw. The lower floor contains an iron working room, with sixteen benches for working in filing, etc.; a speed lathe, two iron lathes with attachments, a shaper, and two drills for wide range of work. There is also an office and a wash room, besides a wide hall containing the twelve-horse power engine, and from which rise the stairs to the floor above. The rear portion contains boiler and coal room, forge shop with six forges, furnished with blast from a fine Sturdevant rotary blower, and a foundry room. The machinery and appliances are first-class in every respect.

The farm of 240 acres, with a large part under cultivation, including the experimental ground of eight acres, containing twenty-five series of plats of seventeen in each series, each plat containing two square rods. The whole ground is surrounded and the plats divided by convenient walks and drives. In stock, we have Jersey cattle, Clydesdale horses and Berkshire swine.

Connected with the departments of Physics and Engineering, we have two fine water meters and a full set of meteorological instruments; also, a full set of standard weights and measures recently prepared for each Agricultural College in the United States, according to joint resolution of Congress to that effect; besides these, we have apparatus for illustrating lectures on the various branches of the subject, especially hydraulics, which has so direct a bearing on the subject of division and flow of water.

The Military department is supplied by the State with sixty stands of arms and accoutrements for practice in military drill, which will be replaced in 1889–90 by cadet rifles and field pieces from the War Department.

The Scientific department is supplied with a fine cabinet of specimens, illustrating Botany, Entomology, Geology and Mineralogy, Zoology and Comparative Anatomy.

The Mathematical department is supplied with a good engineer's transit, a Wye level (15 inch), compass, rods, chains, etc., for practical field work in surveying and engineering.

LOCATION.

Fort Collins, the site of the College, and the County Seat of Larimer County, is a fine town of about 3,000 inhabitants, situated in the beautiful and fertile valley of the Cache la Poudre river, just as it emerges from the foothills which skirt the snowy range. Extended views of the foot-hills and the ranges greet the eye, stretching away to the north and south, and culminating in Long's Peak, with its twin points, which seem like sentinels to guard this portion of the range. In other directions lie fields of growing grain and alfalfa, and gardens of fruits and vegetables. For healthfulness, the location can not be surpassed. There are fewer and less disastrous storms and sudden changes than at any other point on the slope.

The town is having a thriving and steady growth, is well governed, and is taking an advanced position in regard to education and other matters of public import.

The College is situated at the south side of town on gently rising ground. It is connected with the city system of water works, by which good, pure water is furnished for all purposes. The various buildings are located on either side of the Colorado Central Railroad, and front on College Avenue, one of the finest residence avenues in the city.

The town is easily accessible from all parts of the State by means of the Colorado Central, and the Greeley, Salt Lake & Pacific Railroads, by which six trains arrive and depart daily, carrying passengers and mail.

HISTORY.

The State Agricultural College of Colorado, in common with those of other States, had its origin in an act of Congress, passed July 2, 1862, which granted 90,000 acres of land as an endowment fund for a College, "where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in order to promote the *liberal* and *practical* education of the industrial classes in the *several pursuits* and *professions* of life."

No benefit was received from this grant until an act of Congress, passed April 24, 1884, confirmed it to the State. The land is now located, and a very small portion sold, the proceeds from which are to form a perpetual endowment fund.

The State has very generously supported the College by the passage of an act (1883), levying a tax of one-fifth of a mill annually on each dollar of valuation. This gives the College a steady endowment, but not much growth. It is to be hoped that future legislation will give necessary buildings and apparatus.

The College was incorporated by the act of 1870, and the act amended in 1872, and again in 1874, but no steps were taken toward the erection of a College by the Board in charge. In 1877, by death of the President of the Board and removal of other members from the State, an emergency was declared to exist and a new law was passed, which was given immediate effect. To the State Board of Agriculture, as thus reorganized, was entrusted the work of building a College.

The town of Fort Collins was selected as its site, and at a meeting held February 27, 1878, it was determined to erect a building suited to college purposes. The corner stone was laid July 29, 1878, and in the same year the first building was completed. The College was not opened for the reception of students until September 1, 1879. The Dormitory was erected in 1881, and the Chemical Laboratory in 1882, but not thoroughly fitted for work until May, 1883.

A small propagating house was built in 1882, for the purpose of aiding Horticulture. The present Greenhouse with its curvilinear roof and all modern appliances, was completed September 1, 1883. On the same day the Mechanic Shop was completed, its machinery in order and ready to run.

The College now comprises the following distinct departments: Agriculture; Biology; Botany and Horticulture; Chemistry and Zoology; History, Literature and Modern Language; Mathematics; Mechanics and Drawing; Military Science; Physics and Engineering, and the Experiment Station.

CALENDAR.

1889-90.

SEPTEMBER.

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	..	..	..	..	..
..	..	..	..	..	..	..

OCTOBER.

S	M	T	W	T	F	S
..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	..	..
..	..	..	..	..	..	..

NOVEMBER.

S	M	T	W	T	F	S
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
..	..	..	..	..	..	..

DECEMBER.

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..
..	..	..	..	..	..	..

JANUARY.

S	M	T	W	T	F	S
..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	..
..	..	..	..	..	..	..

FEBRUARY.

S	M	T	W	T	F	S
..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	..
..	..	..	..	..	..	..

MARCH.

S	M	T	W	T	F	S
..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	..

APRIL.

S	M	T	W	T	F	S
..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	..	..	..
..	..	..	..	..	..	..

MAY.

S	M	T	W	T	F	S
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
..	..	..	..	..	..	..

JUNE.

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	..	..	..	..	..
..	..	..	..	..	..	..

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REGISTER OF THE

Officers and Students

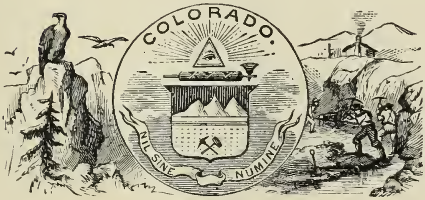
AND

COURSES OF INSTRUCTION

IN THE

State Agricultural College

FORT COLLINS, COLORADO.



1889-90.

Fort Collins, Colorado:
COURIER PRINTING & PUBLISHING CO.
1890.

The State Board of Agriculture.

	TERM EXPIRES.
HON. A. L. EMIGH, Fort Collins,	1897
HON. JOHN J. RYAN, Loveland,	1897
HON. FRANK J. ANNIS, Fort Collins,	1895
HON. CHARLES H. SMALL, Pueblo,	1895
HON. R. A. SOUTHWORTH, Denver,	1893
HON. GEORGE WYMAN, Longmont,	1893
HON. B. S. LaGRANGE, Greeley,	1891
HON. W. F. WATROUS, Fort Collins,	1891
His Excellency GOV. JOB. A. COOPER,	*ex-officio.*
President CHARLES L. INGERSOLL,	

Officers of the Board.

Hon. George Wyman, - - - - President
Hon. Frank J. Annis, - - - - - Secretary
Hon. William H. Brisbane, State Treasurer, (*ex-officio*) Treasurer

Committees.

COLLEGE BUILDINGS.

B. S. LaGrange. C. H. Small. W. F. Watrous.

EXECUTIVE COMMITTEE EXPERIMENT STATION.

J. J. Ryan. W. F. Watrous. G. Wyman.

EXPERIMENT STATION AND SCIENTIFIC EXPERIMENT.

F. J. Annis. C. L. Ingersoll. R. A. Southworth.

FARM.

B. S. LaGrange. R. A. Southworth. J. J. Ryan.

FINANCE.

J. J. Ryan. W. F. Watrous. C. H. Small.

FACULTY, TEXT BOOKS AND COURSE OF STUDY.

C. L. Ingersoll. F. J. Annis. R. A. Southworth.

HORTICULTURE.

W. F. Watrous. A. L. Emigh. F. J. Annis.

MATHEMATICS AND ENGINEERING.

A. L. Emigh. B. S. LaGrange. R. A. Southworth.

MECHANICS AND CHEMISTRY.

C. H. Small. F. J. Annis. W. F. Watrous.

VETERINARY SCIENCE AND STOCK.

R. A. Southworth. A. L. Emigh. J. J. Ryan.

30830

Faculty of Instruction.

CHARLES L. INGERSOLL, M. S.,
President, Professor of Political Economy and Logic.

[*] AINSWORTH E. BLOUNT, A. M.,
Professor of Agriculture.

[†] JAMES CASSIDY, M. S.,
Professor of Botany and Horticulture.

JAMES W. LAWRENCE,
Professor of Mechanics and Drawing.

VASA E. STOLBRAND,
Professor of Mathematics.

MAUD BELL,
Professor of History, Literature and Modern Language.

DAVID O'BRINE, E. M., D. Sc., M. D.,
Professor of Chemistry and Geology.

LOUIS G. CARPENTER, M. S.,
Professor of Physics and Engineering.

[‡] WILLIAM McEACHRAN, M. D., V. S.,
Professor of Biology.

[§] WARREN H. COWLES, 1st Lieut. 16th Infantry, U. S. A.,
Professor of Military Science and Tactics.

[‖] CHARLES S. CRANDALL, M. S.,
Professor of Botany and Horticulture.

GRACE PATTON, B. S.,
Instructor.

FRANK J. ANNIS, M. S.,
Secretary of Faculty.

---

[*] Resigned July 1, 1890.
[†] Died November 21, 1889.
[‡] Chair discontinued December 31, 1889.
[§] Relieved from duty, at his own request, by War Department, July 1, 1890.
[‖] Appointed and began work Jan. 1, 1890.

The State Experiment Station.

BOARD OF CONTROL:

The State Board of Agriculture.

THE EXECUTIVE COMMITTEE IN CHARGE:

HON. JOHN J. RYAN.
HON. W. F. WATROUS.
HON. GEORGE WYMAN.

THE STATION COUNCIL:

C. L. INGERSOLL,	Director
F. J. ANNIS,	Secretary and Treasurer

WORKING STAFF, JULY 1, 1890:

* A. E. BLOUNT,	Agriculturist
DAVID O'BRINE,	Chemist
L. G. CARPENTER,	Meteorologist and Irrigation Engineer
C. S. CRANDALL,	Botanist and Horticulturist

ASSISTANTS:

R. H. McDOWELL,	to Agriculturist
C. M. BROSE,	to Horticulturist
H. L. SABSOVICH,	to Chemist
† WILLIAM J. MEYER,	to Meteorologist
‡ B. C. BUFFUM,	to Meteorologist

SUB-STATIONS.

HARVEY H. GRIFFIN, - - - Superintendent

San Luis Valley Station, Del Norte, Colorado.

FRANK L. WATROUS, - - - Superintendent

Arkansas Valley Station, Rocky Ford, Colorado.

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* Resigned July 1, 1890.
† Resigned June 6, 1890.
‡ Appointed June 6, 1890.

Register of Students.

1889-90.

SENIOR CLASS.

Benson, Clarence V.	Loveland,	Colo.
Benson, Velma V.	“	“
Buffum, Burt C.	Fort Collins,	“
Duncan, Charles A.	Timnath,	“
Garbutt, Newton C.	La Porte,	“
Lunn, Helen E.	Fort Collins,	“
Temple, Harry R.	Chico Springs,	N. M.
Thoman, Cora B.	Fort Collins,	Colo.
Weaver, Mary L.	Columbus,	Ohio

JUNIOR CLASS.

Calkins, John S.	Semper,	Colo.
Elton, Carrie I.	Fort Collins,	“
Evans, Charles R.	“ “	“
McLain, Minnie E.	Timnath,	“

SOPHOMORE CLASS.

Atwood, Joseph T.	Longmont,	Colo.
Beach, Charles W.	Julesburg,	“
Beach, Frank	“	“
Bell, Alice	Chester,	N. H.
Bell, Samuel	“	“
Buffum, George H.	Fort Collins,	Colo.
Carpenter, Don A.	“ “	“
Howard, Bertram K.	“ “	“

Lines, Celia	Platteville,	Colo.
McGee, Edward	Leadville,	“
Preston, Porter J.	Longmont,	“
Ratcliff, Richard	Sedalia,	“
Stimson, Lewis L.	North Platte,	Neb.
Thompson, Frank H.	Castle Rock,	Colo.

FRESHMAN CLASS.

Black, Alameda	Fort Collins,	Colo.
Bloomfield, John	Meeker,	“
Boothroyd, Samuel	Arkins,	“
Brown, Adelbert	Fort Collins,	“
Carmichael, Almet S.	Brighton,	“
Curtis, Loren B.	Denver,	“
Dimmick, Frank M.	Fort McKinney,	Wyo.
Dorsey, George W.	Chico Springs,	N. M.
Garrett, William B.	Fort Collins,	Colo.
Gilkison, Charles J.	“ “	“
Griffith, Fred A.	Tuscon,	Ariz.
Harrington, Minnie F.	Fort Collins,	Colo.
Kendall, Herbert S.	“ “	“
Lewis, Ida M.	“ “	“
Lunn, Will B.	“ “	“
Livingston, Howard J.	“ “	“
Picken, Mabel	“ “	“
Plummer, Charles S.	Fort McKinney,	Wyo.
Ralph, W. John	Fort Collins,	Colo.
Reese, Bertha J.	Lyons,	“
Robinson, Harold F.	Fort Collins,	“
Sexton, William B.	“ “	“
Smith, Homer T.	Manitou,	“
Smith, Mamie O.	Loveland,	“
Swan, Sylvia G.	Fort Collins,	“
Walter, Raymond	“ “	“
Wing, J. Guy	“ “	“

PREPARATORY CLASS.

Anderson, William O.	Columbus,	Neb.
Beach, John T.	Fort Scott,	Kan.
Caulesberry, John H	Leadville,	Colo.
Lewis, Seth C.	Fort Collins,	“
Newton, Clifton	Denver,	“
Parlin, Edward H.	“	“
Sargent, Rodney G.	“	“
Sebree, Robert W.	La Junta,	“
Silcott, Nora	Manhattan,	“
Warren, Charles B.	Fort Collins,	“
Warren, Nathan C.	“ “	“
Witteborg, William	Denver,	“
Voegeli, Henry	Colorado Springs,	“

IRREGULAR AND SPECIAL STUDENTS.

Bristol, Bertha M.	Greeley,	Colo.
Calkins, B. W.	Longmont,	“
Dwiggans, Will C.	Carbondale,	“
Galbraith, Samuel	Fort Collins,	“
Nahikian, Avedis Nahabed	Harpoot, Armenia,	Empire Ottoman
Patton, Jessie	Fort Collins,	Colo.
Willard, Will W.	Aspen,	“

RECAPITULATION.

Seniors	9
Juniors	4
Sophomores	14
Freshmen	27
Preparatory	13
Special students	7
Total	74

Graduates.

1884.

Elizabeth Lawrence, B. S., *nee* Coy, Fort Collins, Colo.....At Home
Leonidas Loomis, B. S., Green River City, Wyo...........Stockman
George H. Glover, B. S., D. V. M., Longmont, Colo..............

1885.

Cora B. Blinn, B. S., Berthoud, Colo........................Teacher
Edna Hice, B. S., Fort Collins, Colo........................Teacher
Lelia Robertson, B. S., *nee* Loomis, Fort Collins, Colo......At Home
Grace Patton, B. S., Fort Collins, Colo..... ....
........................Instructor at State Agricultural College
Robert E. Trimble, B. S., Fort Collins. Colo................Merchant
Helen Rigden, B. S., *nee* White, Fort Collins, Colo........ At Home

1886.

Wilbert J. Sickman, B. S., Fort Collins, Colo..............Merchant

1887.

Eleanor F. Gill, B. S., Berthoud, Colo......................Teacher
Daisy E. Stratton, B. S., Buffalo, Wyo.........Clerk (County Offices)
Lerah G. Stratton, B. S., Fort Collins, Colo.....................
..........................Librarian, State Agricultural College
Edwin G. Nettleton, B. S., Nampa, Idaho.....Commission Merchant

1888.

Lewis A. Coffin, B. S., Longmont, Colo....... ....Farmer
Harvey H. Griffin, B. S., Del Norte, Colo.......................
..........Superintendent San Luis Valley Experiment Station
Josephine Lee, B. S., Fort Collins, Colo.....................Teacher
Genevieve E. McLain, B. S., Fort Collins, Colo.................
.............................Teacher, Fort Collins City Schools

1889.

Lucy Bell, B. S., Pinkhampton, Colo.	Teacher
Arthur L. Davis, B. S., Arvada, Colo.	Farmer

1890.

Clarence V. Benson, B. S., Loveland, Colo.	Farmer
Velma V. Benson, B. S., Manhattan, Colo	Teacher
Burt C. Buffum, B. S., Fort Collins, Colo.	Assistant to Meteorologist, State Experiment Station
Charles A. Duncan, B. S., Timnath, Colo.	Farmer
Newton C. Garbutt, B. S., La Porte, Colo	At Home
Helen E. Lunn, B. S., Fort Collins, Colo.	At Home
Harry R. Temple, B. S., Boulder, Colo	Stockman
Cora B. Thoman, B. S., Fort Collins, Colo	At Home
Mary L. Weaver, B. S., Columbus, Ohio	Student

COURSE OF STUDY.

PREPARATORY YEAR.

FIRST TERM.

Arithmetic	Sanford's Analytic
Elocution	Fenno
Word Analysis	Swinton
Drawing	Free Hand

Labor, two hours, farm.

SECOND TERM.

Arithmetic	Sanford's Analytic
English Analysis	Kellogg
U. S. History	Johnston
Composition	Swinton

Labor, two hours, shop.

THIRD TERM.

Arithmetic	Sanford's Analytic
Physical Geography	Houston
English Analysis	Kellogg
Drawing	Free Hand

Labor, two hours, garden.

Military drill, daily.

FRESHMAN YEAR.

FIRST TERM.

Algebra	Olney
History	Swinton
Botany	Gray
Drawing	

Labor, two hours, garden.

SECOND TERM.

Algebra	Olney
History	Swinton
Bookkeeping	Meservey
Composition amd Rhetoric	Kellogg

Labor, two hours, shop.

THIRD TERM.

Algebra	Olney
English Literature	Kellogg
Botany	Gray, with Coulter's Flora
Drawing	

Labor, two hours, farm.

Military drill, daily.

SOPHOMORE YEAR.

FIRST TERM.

Geometry	Wentworth
Chemistry	Norton
Literature	Kellogg
Drawing	

Labor, two hours, chemical laboratory.

SECOND TERM.

Geometry	Wentworth
Chemistry	Norton
Physiology	Martin
Rhetoric	D. J. Hill

Labor, two hours, chemical laboratory.

THIRD TERM.

Trigonometry, six weeks,	Wentworth
Surveying, seven weeks,	Davies
Physiology	Martin
Hydraulics	Lectures
Chemistry	Norton

Labor, two hours: Chemical laboratory, six weeks.
Labor, two hours: Surveying, seven weeks.

Military drill, daily.

The Course from this point is separated into:

1. The Agricultural Course.
2. The Mechanical Course.
3. The Irrigation Engineering Course.
4. The Ladies' Course.

Agricultural Course.

JUNIOR YEAR.

FIRST EERM.

Agriculture	Lectures
Physics	Deschanel
Zoology	Packard
Horticulture	Lectures

Labor, two hours:
- Physical laboratory, two days.
- Horticulture, two days.
- Zoological laboratory, one day.

SECOND TERM.

Analytic Geometry	Olney
Physics	Deschanel
Geology	Le Conte
Agricultural Chemistry	Storer

Labor, two hours:
- Physical laboratory, two days.
- Chemical laboratory, three days.

THIRD TERM.

Entomology	Packard
Physics	Deschanel
Geology	Le Conte
Agricultural Chemistry	Storer

Labor, two hours:
- Physical laboratory, two days.
- Chemical laboratory, three days.

SENIOR YEAR.

FIRST TERM.

Agriculture	Lectures
Landscape Gardening	Kemp
Astronomy, seven weeks,	Newcomb
Meteorology, six weeks,	Lectures
Elective Study	

Labor, two hours, farm.

SECOND TERM.

Agriculture	Lectures
Horticulture	Lectures
Logic	Fowler
Elective Study	

Labor, two hours, garden.

THIRD TERM.

Agriculture	Lectures
Advanced Botany	Lectures
Political Economy	Lectures
Elective Study	

Labor, two hours: Farm, two days.
Garden, three days.

Military drill, daily throughout the course.

Mechanical Course.

JUNIOR YEAR.

FIRST TERM.

Higher Algebra	Olney
Physics	Deschanel
Zoology	Packard
Drawing	

Labor, two hours:
- Physical laboratory, two days.
- Mechanic shop, two days.
- Zoological laboratory, one day.

SECOND TERM.

Analytic Geometry	Olney
Physics	Deschanel
Geology	Le Conte
Drawing	

Labor, two hours:
- Physical laboratory, two days.
- Mechanic shop, three days.

THIRD TERM.

Descriptive Geometry	Church
Physics	Deschanel
Geology	Le Conte
Drawing	

Labor, two hours:
- Physical laboratory, two days.
- Mechanic shop, three days.

SENIOR YEAR.

FIRST TERM.

Differential Calculus	Olney
Astronomy, seven weeks,	Newcomb
Meteorology, six weeks,	Lectures
Psychology	Porter
The Steam Engine	Lectures

Labor, two hours, mechanic shop, five days.

SECOND TERM.

Integral Calculus	Olney
Logic	Fowler
Transmission of Power	Lectures
Thesis Work	

Labor, two hours, mechanic shop, five days.

THIRD TERM.

Special Chemistry	Lectures
Political Economy	Lectures
Study of Special Machines	Lectures
Thesis Work	

Labor, two hours, mechanic shop, five days.

Military drill, daily throughout the course.

Irrigation Engineering Course.

JUNIOR YEAR.

FIRST TERM.

Higher Algebra	Olney
Physics	Deschanel
Zoology	Packard
Hydraulics	Lectures

Labor, two hours: { Physical laboratory, two days.
Field work in Irrigation, two days.
Zoological laboratory, one day.

SECOND TERM.

Analytic Geometry	Olney
Physics	Deschanel
Geology	Le Conte
Drawing	

Labor, two hours: { Physical laboratory, two days.
Geological laboratory, three days.

THIRD TERM.

Descriptive Geometry	Church
Physics	Deschanel
Geology	Le Conte
Irrigation Engineering	Lectures

Labor, two hours: { Physical laboratory, two days.
Geological laboratory, three days.

SENIOR YEAR.

FIRST TERM.

Differential Calculus	Olney
Astronomy, seven weeks,	Newcomb
Meteorology six weeks,	Lectures
Psychology	Porter
Hydraulics, Canals and Canal Work	Lectures

Labor, two hours, field work in engineering, five days.

SECOND TERM.

Integral Calculus	Olney
Logic	Fowler
Horticulture	Lectures
Drawing	

Labor, two hours, mechanic shop, five days.

THIRD TERM.

Special Chemistry	Lectures
Political Economy	Lectures
Hydraulics	Lectures
Thesis Work	

Labor, two hours, field work in irrigation, five days.

Military drill, daily throughout the course.

Ladies' Course.

JUNIOR YEAR.

FIRST TERM.

Drawing	
Physics	Deschanel
Zoology	Packard
German	Otto's German Grammar

Laboratory work as in other courses, in Physics and Zoology.

SECOND TERM.

Stenography and Type-writing	Lectures and Practice
Physics	Deschanel
Geology	Le Conte
German	Otto's German Grammar

Laboratory work as in other courses, in Physics and Geology.

THIRD TERM.

Drawing	
Physics	Deschanel
Geology	Le Conte
German	Readings and Otto's Grammar

Laboratory work as in other courses, in Physics and Geology.

SENIOR YEAR.

FIRST TERM.

Landscape Gardening	Kemp
Astronomy, seven weeks,	Newcomb
Meteorology, six weeks,	Lectures
Psychology	Porter
German	Readings and Grammar

SECOND TERM.

Horticulture	Lectures
Drawing	
Logic	Fowler
German	Readings and Grammar

THIRD TERM.

Drawing	
Political Economy	Lectures
Thesis Work	
German	Readings and Grammar

RECITATION SCHEME—FALL TERM.

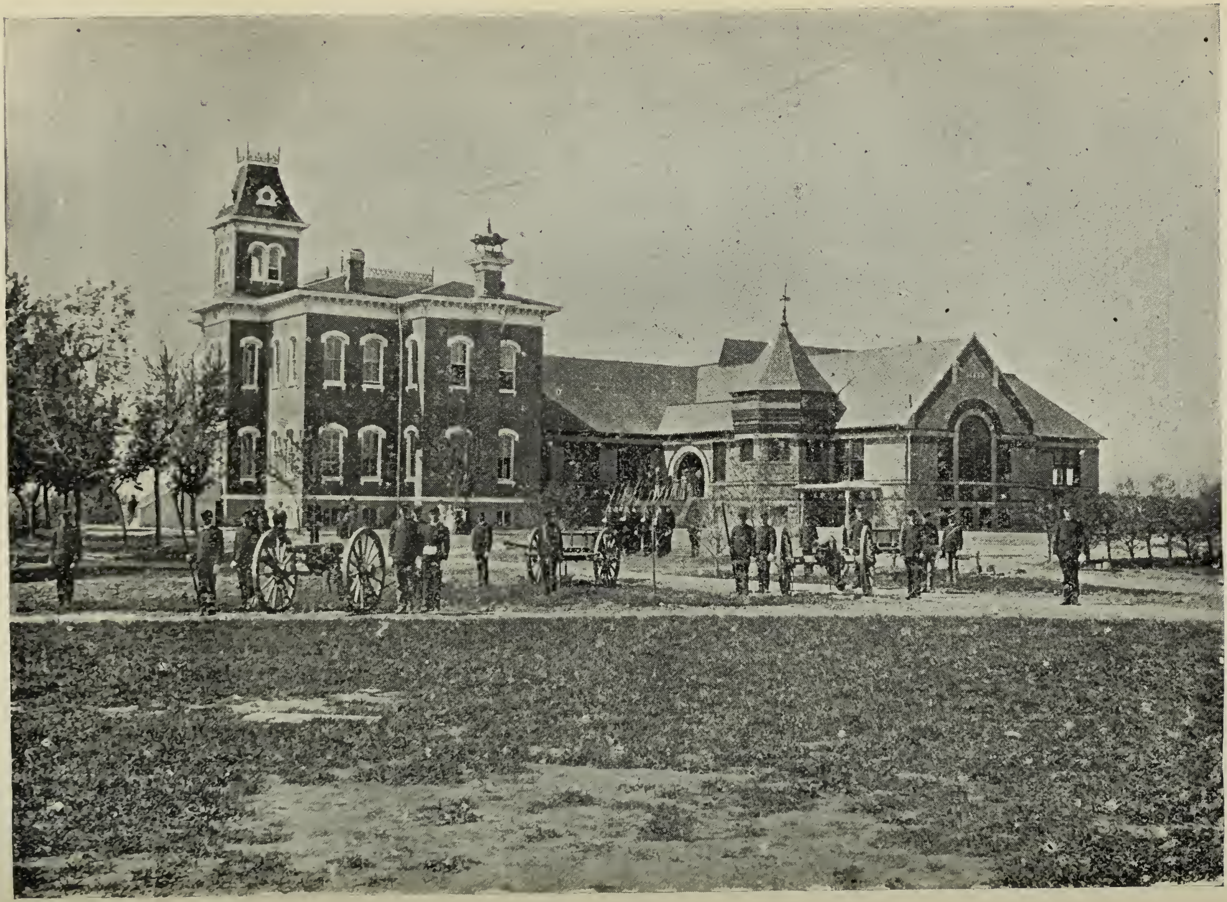
TIME.	PREPARATORY.	FRESHMAN.	SOPHOMORE.	JUNIOR.	SENIOR.
8 a. m.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.
8:10 a. m.	Arithmetic.	History.	Drawing.	Physics.	Landscape Gardening. Differential Calculus.
9 a. m.	Free Hand Drawing.	Algebra.	Literature.	Hydraulics. Horticulture. Drawing.	Psychology. Agriculture.
9:50 a. m.	Elocution.	Botany.	Geometry.	Zoology.	German. Hydraulics, Canals, etc. The Steam Engine.
10:40 a. m.	Word Analysis.	Drawing.	Chemistry.	German. Higher Algebra. Agriculture.	Astronomy, 7 wks. Meteorology, 6 wks.
11.30 a. m. to 12:15 p. m.	Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.
Labor 1:30 p. m. to 3:30 p. m.	Farm, 5.	Garden, 5.	Chemical Laboratory, 5.	Mechanic Shop, 2. Physical Laboratory, 2. Zoological Laboratory, 1 Field Work, 2.	Mechanic Shop, 5. Field Work, 5. Farm 5.

RECITATION SCHEME—WINTER TERM.

TIME.	**PREPARATORY.**	**FRESHMAN.**	**SOPHOMORE.**	**JUNIOR.**	**SENIOR.**
8 a. m.	General Assembly of Students.	General Ascembly of Students.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.
8:10 a. m.	Arithmetic.	Rhetoric.	Physiology.	Physics.	Integral Calculus. German. Agriculture.
9 a. m.	English Analysis.	Algebra.	Rhetoric.	Geology.	Horticulture. Transmission of Power.
9:50 a. m.	U. S. History.	History.	Geometry.	Agricultural Chemistry. Drawing. Stenography and Type Writing.	Logic.
10:40 a. m.	Composition.	Bookkeeping.	Chemistry.	Analytic Geometry. German.	Elective Work. Thesis Work. Drawing.
11:30 a. m. to 12:15 p. m.	Military Drill.	Military Drill.	Military Drill.	Military Drill.	Free Hand Drawing. Military Drill.
Labor 1:30 p. m. to 5:30 p. m.	Mechanic Shop, 5. Two Divisions.	Mechanic Shop, 5. Two Divisions.	Chemical Laboratory, 5.	Physical Laboratory, 2. Chemical Laboratory, 3. Geological Laboratory, 3 Mechanic Shop, 3.	Mechanic Shop, 5. Horticulture, 5.

RECITATION SCHEME—SPRING TERM.

TIME.	PREPARATORY.	FRESHMAN.	SOPHOMORE.	JUNIOR.	SENIOR.
8 a. m.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.	General Assembly of Students.
8:10 a. m.	Arithmetic.	Literature.	Physiology.	Physics.	Poitical Economy.
9 a. m.	Free Hand Drawing.	Algebra.	Chemistry.	Agricultural Chemistry. Drawing. Irrigation Engineering. German.	Advanced Botany. Thesis Work.
9:50 a. m.	Physical Geography.	Botany.	Trigonometry, 6 wks. Surveying, 7 wks.	Geology.	Hydraulics. Special Machines. Agriculture. German.
10:40 a. m.	English Analysis.	Drawing.	Hydraulics.	Descriptive Geometry. Entomology.	Special Chemistry. Elective Work.
11:30 a. m. to 12:15 p. m.	Military Drill.	Free Hand Drawing. Military Drill.	Military Drill.	Free Hand Drawing. Military Drill.	Free Hand Drawing. Military Drill.
Labor 1:30 p. m. to 3:30 p. m.	Garden, 5.	Farm, 5.	Chemical Laboratory, 5; 6 weeks. Field Work in Surveying, 5; 7 weeks.	Physical Laboratory, 2. Chemical Laboratory, 3. Geological Laboratory, 3 Mechanic Shop, 3.	Mechanic Shop, 5. Farm, 3. Horticulture, 2. Hydraulics, 5.



MAIN COLLEGE BUILDING.

DEPARTMENTS OF

INSTRUCTION AND LABOR.

AGRICULTURE.

This study is begun by a course of lectures in the first term of the Junior year, in which are discussed the various breeds of horses, cattle, sheep, swine and poultry; their history, adaptation, etc., together with improved methods of handling.

During the Senior year, in three terms, the following subjects are considered: First, the preparation of the soil, seeding, harvesting, threshing, marketing; farmyard manures, their application and utility; irrigation and its application; also, the principles of stock feeding for flesh and other products are examined.

Second, the course is continued by lectures on rotation of crops, farm drainage, implements, cereals, and their improvement by selection, crossing and care; also, the careful employment and superintendence of labor.

Third, stock-breeding and dairying are considered.

The students are required by law to labor on the farm and experimental grounds two hours each school day, of one term in each of the first two years of the course, and in part of the Senior year.

"Labor and study, theory and practice go hand in hand. To know how and when to do work well is a science. That they may obtain the science, study is necessary; to get the art, work is indispensable."

BIOLOGY.

The chair of Biology has been discontinued, and the work distributed among other departments of the College.

PHYSIOLOGY

forms part of the work of the Sophomore year. It consists of a course of two terms' study of Martin's Human Body, illustrated by demonstrations, models and plates; the Human Skeleton and Anatomical Specimens.

ZOOLOGY.

This branch of comparative study is taken up in the first term of the Junior year. Packard's Zoology, briefer course, is used as a text book; and is supplemented by lectures and laboratory work, which consists of dissections, drawings and classification of the animal world. The facilities for this work are now excellent, as the College possesses a set of both marine and inland fauna, to which additions are constantly being made.

ENTOMOLOGY

is taken up in the third term of the Junior year. Packard's Entomology for beginners, being used as a text book. The course will consist of recitations, supplemented by collections of insects, which will be studied in the laboratory, classified and mounted. The collections made by each class will become part of the College museum.

The laboratory is fitted with Bauch and Lomb's dissecting microscopes, and all other apparatus necessary to scientific investigation, including breeding cages for insects, in which the students can observe the habits and metamorphoses.

BOTANY.

The study of Botany begins in the first term of the Freshman year, in which the organs of plants, their physiology and anatomy, are briefly considered. During a portion of this term a number of flowers are analyzed, and a few plants collected and prepared for the herbarium.

In the Spring term of the same year, students study plants systematically, and learn to become familiar with the leading natural orders.

The terms used in descriptive Botany are studied in this connection, so that each student may understand the methods of determining the scientific names of plants.

Each student is required to make drawings, with descriptions of plants studied.

ADVANCED BOTANY.

In the third term of the Senior year, the agricultural students study vegetable physiology and the minute structure of plants, including the modifications of the vegetable cell, its products and the various kinds of plant tissue.

A portion of this term is devoted to cryptogamic botany, especially the moulds, rusts, smuts and mildews, so destructive to useful plants.

Students have the use of compound microscopes, and work two hours, two days per week, in the Botanical laboratory.

An herbarium of native and foreign plants and a large greenhouse furnish material for study.

Books of reference—Gray and Coulter, Gray's Botanical Text Book, Vol. I., Goodale's Vegetable Anatomy and Physiology, Sachs, Lesquereux, Bessey, Cook, Darwin and others.

HORTICULTURE.

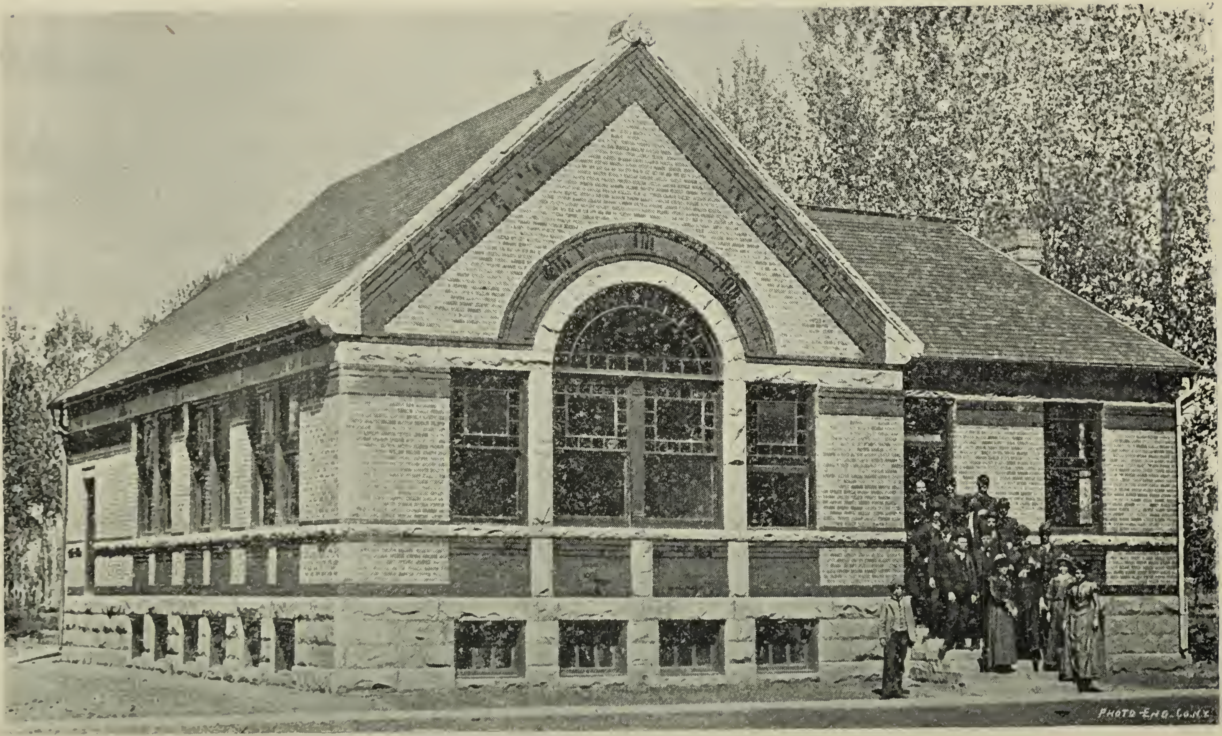
Instruction in the several branches of Horticulture is given as follows: In practical Floriculture, by lectures upon such topics as the construction, heating and management of greenhouses; the propagation of plants by seed, cutting, layers, budding and grafting; how budding and grafting are performed, and their uses; the cultivation and general management of greenhouse plants for commercial or private purposes; insects and diseases of plants under glass, with remedies therefor; parlor gardening, Wardian cases and ferneries; arrangement of flowers in bouquets and floral designs.

Instruction in Pomology is given by lectures, and embraces a theoretical and practical study of the propagation, planting, pruning and general management of orchards and small fruit gardens; insect enemies, diseases and varieties best adapted to this latitude; classification of fruits by form, habit of growth, flowers and leaves.

Vegetable culture comprises kitchen and market gardening and seed growing, and the principal topics considered are: The best situation for, and the laying out of the garden, with a view to its irrigation and most economical management, in the rotation and planting of crops for the family and for market; management of composts and commercial fertilizers; care of tools; selection and growing of seeds; construction, management and uses of hotbeds and cold-frames; harvesting, marketing and storing of fruits and vegetables.

Forestry is taught by lecture, special attention being given to such topics as the value of trees and shrubs for timber and ornaments, for hedges, screens and shelter belts for this State; the best methods of culture, with a history of varieties, especially such as are thought worthy of trial in this latitude.

Landscape gardening is taught in the Senior year by regular study of text book: Kemp's "How to Lay Out a Garden," and lectures, adapted as much as possible to the exigencies of this climate, frequent use being made of the grounds and their planting for illustration. The orchards,



BOTANICAL AND HORTICULTURAL LABORATORY.

nursery, greenhouse, vegetable garden and flower garden afford ample opportunity to the students to acquire a practical acquaintance with the above topics. Each student, before completing the study, must complete a formal plat, arranged with reference to the best principles of the art.

CHEMISTRY.

It is the object of this department to give the student an opportunity to acquire a thorough mastery of the elementary principles of chemical science. To attain this object, theory and practice are made to go hand in hand. In the first term of the Sophomcre year, the class listens to a series of lectures, accompanied with text book work, upon the general theory of the science, its history and development. In this course of lectures are discussed the subjects of acids, bases and salts, and the principles of chemical philosophy. The natural history, chemical and physical properties of each of the elements are discussed in detail, the whole being illustrated by experiments. While taking this course, the student spends two hours each day in the chemical laboratory, repeating the experiments shown in the class room, and making others which may be suggested, thus serving to familiarize him with the various forms of compounds, the marked distinctions between the different classes of salts, the use of chemical nomenclature, and the manipulation of apparatus. Practice in the use of the blow-pipe accompanies this work, and an insight into determinative mineralogy is thus acquired. The use and application of the spectroscope is also taught. The students in the laboratory, at the end of the first term, are examined in the text book (O'Brine's Laboratory Guide), and by analysis of *unknown bodies* in the dry way.

In the second term of the Sophomore year the inorganic chemistry is finished and organic chemistry is taken up. The laboratory work continues during the term, and the student takes up the tests for the bases and their separation; also, the tests for the acids and their separation. The students are examined, at the close of the second term, by unknown bodies, composed of mixtures of the several groups of bases and acids.

In the third term of the Sophomore year the class completes organic chemistry, with some practice in chemical physics and stoichiometry. In the laboratory, the separation of the bases and acids is reviewed, tests for the poisons and their separation from organic mixtures, organic compounds are made, and volumetric analysis completed.

In the Agricultural course, in the second and third terms of the Junior year, the students listen to a course of lectures upon agricultural chemistry, in which are discussed such subjects as the following: Relation of chemistry to agriculture; the literature of agricultural chemistry; elements of plant growth, their relative abundance and importance; the atmosphere; the soil, fertilizers, etc. Storer's Agriculture, Johnson's "How Crops Grow" and "How Crops Feed" are used as reference books. Laboratory work accompanies the lectures and text books. The study of quantitative analysis begins in the gravimetric way, and, after some little practice, students will be directed in any line of special work they may desire.

In the third term of the Senior year, of the Mechanical course, the students study the chemistry of alloys, iron, steel and fuel, and in the laboratory they are taught the analysis of these bodies, including furnace gases.

In the third term of the Senior year, of the Irrigation course, the students study the chemistry of building materials, using Wagner's Chemical Technology as a guide. In the laboratory they have the analysis of soils and water. Students, who desire it, will have an opportunity to see, in the Station laboratory, the analysis of food, blood, poisons, urine, water, coal, minerals, soils, assaying and gas analysis. Keeping in mind the object for which our College is founded, we have so planned our Chemical course as to prepare the student for the general application of chemistry in relation to the industrial arts, while seeking to thoroughly ground him in the application of the science to agriculture. A new Chemical laboratory, fitted up with modern appliances and desks for thirty-six students, is ready for the classes.

Students have access to the following current chemical literature: *Chemical News, Journal of Analytical Chemistry*, and a complete set of "Fresenius Zeitschrift fur Analyt. Chemie.; also, the following works of reference: Watt's Dictionary of Chemistry, the works of Roscoe, Schorlemmer, Bloxam, Tidy, Miller, Stricker, Pinney, Fowne, Wagner; in analysis, the works of Fresenius, Wills, Classen, Prescott, Thorpe, Wohler, Crooke's Select Methods, Allen's Organic Analysis, Hart, Sutton, Blythe, etc.

GEOLOGY.

Recognizing the fact that Chemistry and Geology are the foundations of agricultural science, the subject of Geology receives corresponding attention. The second term of the Junior year, LeConte's Elements of Geology is taken up and continued during the year. The students work two hours, three days per week, in the laboratory. Lectures on Economic Geology are also given, using William's Manual as a guide. Frequent visits to the mountains and quarries illustrate the practical application of dip, strike, fault, formations, stratifications, and elevations by barometer, thermometer and level, whenever field work is practicable. At the end of the third term the students are required to identify and describe twenty-five rocks or mineral specimens.

The following works of reference are accessible to the students: Croll, Bischof, Lyell, Dana, Nicholson, Geikie, Van Cotta, Platner, Brush, Elderhorst and the geological reports of other States. Contributions to this department will be thankfully received and credit given.

HISTORY, LITERATURE AND LANGUAGE.

HISTORY AND LITERATURE.

During the first two terms of the Freshman year, Swinton's Outlines of the World's History is studied, and the work is supplemented by lectures. During each of these two terms, each pupil is required to write an essay upon some historical period or subject. He thus acquires a good general knowledge of history, with an exact knowledge of some special period or historical subject. This method is designed to arouse a taste for pursuing the study of history in after life.

The last term of the Freshman year and the first term of the Sophomore year are devoted to English Literature, with critical readings of selected authors, and special attention to the writings of the five great English poets, and to the works of American writers. Each student is expected to select the works of some great author for special reading during each term. A careful oversight of all outside reading is attempted, and every effort is used to promote a taste for good literature.

ENGLISH.

The study of Word Analysis is begun and a review of English Analysis continued through the Preparatory year. In the Winter term, Preparatory year, the class studies Swinton's Composition, devoting special attention to punctuation, capitalization, the arrangement and structure of sentences, and the fundamental principles of style.

During the second term, Freshman year, the subject of English Composition is continued, with Kellogg's Rhetoric for a text book. The student gives attention to the subject of style and is made familiar with good English. It is the object of this work to give the student ability to write a clear, neatly arranged letter, properly spelled, punctuated and composed, and to give him some skill in the logical arrangement of his written thoughts.

During this course in English, the student writes a composition each week, or more often, as required.

During the Spring term of the Sophomore year, the study of the English Language is continued by the study of D. J. Hill's Rhetoric.

GERMAN.

German is studied during the Junior and Senior years. The great increase of the German population in America during the last thirty years has made a practical knowledge of the German language a business commodity as well as an elegant accomplishment. A course of two years in German is not sufficient to give a mastery of the language, but the limited time of study is occupied in giving, as far as possible, power to converse in every day life. The recitations are conducted in the language studied, and much stress is placed upon the ability to converse as the most certain way to read and use German effectively. It is thought that the study of some language besides his own is of great assistance to the pupil as a means of mental growth. During the Junior year, Worman's First and Second German books are used, and Andersen's Selected Fairy tales, with frequent additional exercises in German grammar and composition. During the last year the time is equally divided between technical and literary German.

A play from Schiller and selection from Faust are read, with practice in reading at sight, and the study of some German scientific work is also pursued.

MATHEMATICS.

The instruction offered by this department is designed to conform to the general aim and purpose of the institution; accordingly, only those branches of pure mathematics are taught which bear directly upon the curriculum, and which are a necessity in the every day life and business of the well-rounded business man.

Withal, the course as pursued is very nearly equal, by subjects, to that pursued in the ordinary classical course of Eastern colleges, but is less in detail, while the attention given to the applied mathematics, including surveying and irrigation canal engineering, is much greater.

ARITHMETIC.

Students pursue, during the Preparatory year, the subject of Arithmetic; the first and second terms being devoted exclusively to decimal notation and analysis; the third term to the shorter, practical methods of commercial operations.

ALGEBRA.

The study of Algebra is begun in the first term of the Freshman year, and runs through that year. The first term is devoted mainly to the fundamental principles and operations governing the literal notation and factoring, the endeavor being to so thoroughly ground the student that the succeeding operations may be more of an unfolding process than a task and revelation.

The second and third terms' work is devoted to the study of Algebra proper, the Quadratic Equations, and so much more as the ability of the average class will allow.

GEOMETRY.

Geometry is placed in the first term Sophomore and nine weeks of the second term. Problems in Mensuration and original exercises will be added to the routine text book work, giving the student frequent practice in the application of principles already acquired, and fixing firmly the knowledge gained.

TRIGONOMETRY

occupies the first six weeks of the third term Sophomore year. Plane Trigonometry, occupying a more practical place in the general run of business, is the only part taught. Thus, six weeks has been considered sufficient, since it is followed in the remaining seven weeks of the term by its congener, Surveying, which, besides a fair share of field work, includes the theory, use and adjustment of the instrument, the history and practice of the U. S. Land surveys, and mapping some plat, the notes of which are entirely the work of the class in the field.

Higher Algebra is taken up by the Juniors of the Mechanical and Irrigation Engineering courses in their first term. Reviewing Quadratics and the Calculus of Radicals, the terms' work will cover the theory of Equations, the theory and use of Logarithms, etc., as complete a purely Algebraic course as will fit the student for the intelligent study and use of Algebraic forms and terms in his subsequent work.

Following Algebra, in the second term Junior, so much of Analytic Geometry as is necessary in Physics, Astronomy and Hydraulic Formulæ, will be given in a daily recitation.

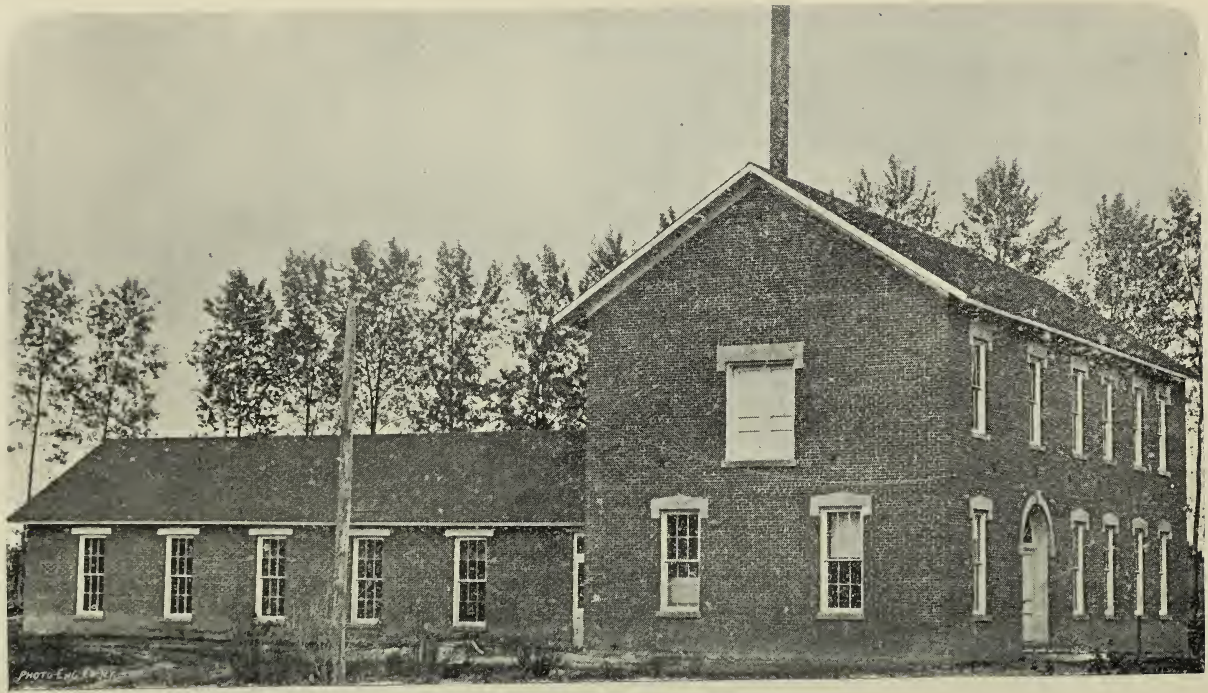
Descriptive Geometry, Orthographic Projection, Linear Perspective, Shades and Shadows, etc., will occupy the third term.

The Calculus—Differential and Integral—will take the first and second terms respectively of the Senior year. The subject will be taught by the infinitesimal method, rather than by the Theory of Limits, which is more adapted for the scholar than for the college student, and will be sufficiently full to enable him to solve, discuss and use the Calculus of any ordinary work on strains used in the in the average technical course.

PRACTICAL MECHANICS.

The old system of apprenticeship is rapidly becoming a thing of the past, and it is now almost impossible for a boy to learn a trade in any modern shop or factory. This is owing largely to the introduction of special machinery, necessitating special workmen to manage it, and the workman who has learned to run a machine of this kind is kept at that work, as being most profitable to his employer. His practical knowledge of other methods and machines is, therefore, confined to narrow limits, and should a vacancy occur in a superior position, he is not fitted for the place, from the fact of his being unacquainted with other practical parts connected with his trade, the manipulations and principles involved in which he has had no opportunity to learn.

This department has for its object a systematic and progressive education in the use of tools and materials, combined with as much theoretical knowledge as shall be deemed necessary to explain the principles involved. It does not teach special trades, nor manufacture salable articles; to do so would require that the student be kept on the kind of work he could do best, and thus prevent him from acquiring broad and liberal ideas of other methods. So, without teaching any one complete trade, the mechanical principles of many are gained. This does not necessarily mean that the student becomes sufficiently



MECHANIC SHOP.

expert to compete with the skilled mechanic, but that a knowledge of *how* a tool or machine should be used, and the manner of *laying out work* for the same, is thoroughly taught.

Should the circumstances be such that the student enter manufacturing, his ideas having been broadened by this training, he will the more readily grasp anything new that may come up in his business, or, if he take up farming, he will, with greater ease, be able to understand the mechanical principles and workings of his machinery, and also how to keep it and his buildings in proper repair.

The shop instruction will be divided into courses as follows, and in each course will be given, in connection with the work, an explanation of the construction of each tool, and its manner of acting on the material, the methods of determining how to select materials best suited to different kinds of work, the manner of laying out work, cutting speed of tools, etc.

COURSE OF LABOR.

FIRST YEAR.

Bench work in wood	14	weeks
Machine work in wood	4	"
Pattern making	12	"
Vise work in iron	10	"

SECOND YEAR.

Iron forging	14	weeks
Steel forging	4	"
Machine work in iron	20	"

BENCH WORK IN WOOD.

This course consists of exercises with the different wood-working bench tools, so arranged in a graded series as to embrace the manipulation of the tools in their various applications.

First—The use of planes in joining, smoothing and getting the piece out of wind, lining off, and the use of saws in cutting across and with the grain, and keeping to line.

Second—Halved splice.
Third—Splayed splice.
Fourth—Keyed splice.
Fifth—Open dovetail mortise and tenon joint.
Sixth—Mortise and tenon joint.
Seventh—Open dovetail joint.
Eighth—Blind dovetail joint.
Ninth—Lap joint.
Tenth—Dowel joint.
Eleventh—Small newel post with hand-worked rail.
Twelfth—Panel door.
Thirteenth—Roof truss.
Fourteenth—Box.
Fifteenth—Carpenter's trestle.

MACHINE WORK IN WOOD.

In connection with this course, with the use of tools, will be given the most rapid and economical method of selecting and preparing the wood for the machine. There will be given examples of

First—Straight turning.
Second—Cutting in and squaring off.
Third—Convex, concave and compound curves.
Fourth—Handles for chisels and other tools.
Fifth—Examples in chuck work in separate and combined pieces.
Sixth—How to turn a ball.

PATTERN MAKING AND FOUNDRY WORK.

After becoming familiar with bench and machine work in wood, an application of both is made, by constructing patterns with due regard to shrinkage, draft, and the best method of constructing the pattern, so that it causes the least amount of trouble in the foundry. There will be given examples of

Plain work.

Core work.

Pully work.

Pipe work.

Gear work.

Core boxes, their use and construction.

Cutting speed of tools, and proper angle of cutting edge for different purposes and different metals.

Centering and straightening work.

Straight turning and squaring.

Boring.

Making and fitting joints.

Chuck work.

Screw cutting, inside and outside.

Drilling, tapping and reaming.

Boring with boring bar and use of center rest.

Polishing and finishing.

Hand tool work.

DRAWING.

Free-hand copy and dictation.

Free-hand model and object drawing.

Light and shade.

Geometric problems.

Orthographic and isometric projections, and projection of shadows.

Development and intersection of surfaces.

Wood carving, diaper, incised and relief.

Persons having parts of machines, patterns, small models or working drawings, may, if they choose, donate the same to the department, and thereby confer a great favor upon the College, and especially upon the department.

MILITARY SCIENCE.

For instruction in Military Tactics, the students are formed into companies. The system of instruction being that in use in the United States army, is calculated to form the habit of prompt obedience, foster the natural martial instinct, and prepare the students, should necessity arise, to organize and drill a company or battalion of our National militia.

The drill includes the school of the soldier, company and battalion, in Infantry tactics, supplemented by lectures on the art and science of war.

Instruction in Artillery embraces such portions of the United States drill regulations as pertain to the formation of detachments, manual of the piece, mechanical maneuvers, aiming drill, etc. For use in drill the department has two 3-inch rifled field pieces, from the Rock Island Arsenal, and seventy cadet rifles with accoutrements.

Military drill is required of each male student, unless excused for physical disability, or by special vote of the Faculty for good and satisfactory reasons. Each cadet is required to purchase a copy of the standard United States Infantry Tactics for study and reference; he is also to provide himself with a uniform, modeled somewhat after the uniform of the regular army; it is neat and durable, consists of blouse, pantaloons, cap and gloves, and costs about twenty dollars.

In the Fall and Spring terms a period of forty-five minutes daily is devoted to outdoor maneuvers; during the Winter the new Armory is used, and a portion of the time is devoted to recitations in Tactics and lectures. When possible, an encampment will be held at the close of the Spring term for practical instruction in guard and field duty.

PHYSICS.

The study of Physics, taking up the branches of Mechanics, Heat, Light, Sound, and Electricity and Magnetism, will continue through the three terms of the Junior year. Where possible, the topics discussed will be illustrated by apparatus and experiment. In the afternoons, the student will be given an opportunity to perform many of the experiments, and to construct philosophical instruments. Laboratory instruction will be given two days in the week during the year.

Astronomy is studied for the first seven weeks of the first term Senior year. It will include a study of the earth in its relation to the rest of the solar system, the movements of the solar system and their causes and effects, the sun, stars and planets, nebulæ, comets and meteorites, and some effort will be made, by means of a good achromatic telescope, to make some of the interesting forms visible.

Meteorology will be taken up the remaining six weeks of the term, and will include a discussion of the instruments used in taking observations, barometry, thermometry, precipitation, the laws of storms and the elements of agricultural meteorology.

IRRIGATION ENGINEERING.

The course in Irrigation Hydraulics, in the last term of the Sophomore year, is intended as an elementary course, complete in itself, for the students of all departments. It will include the elementary facts concerning our irrigation system and the laws of water, which every citizen should know. At the same time, it will serve as a preliminary course to the special course offered in the Junior and Senior years in Irrigation Engineering.

This preliminary course will include a discussion of the distribution of water by the State and by ditches, priorities, water commissioners and their duties, the measurement of water in streams, canals and ditches, means of obtaining constant flow, weir measurement, the elements of irrigation engineering, including location, grade, cross section, construction of flumes, embankments, etc., etc. Instruction will be given by lectures. Each student will be expected to spend some time in studying some canal.

The course of Irrigation Engineering will extend through the Junior and Senior years. It will include instruction in theoretical and practical hydraulics. Gaugings will be made of canals and streams. Experiments will be made on the flow and measurement of water. A study will be made of the canals of this State and of other countries, having in view the lessons to be learned from their construction. Instruction will be given in the construction of flumes, headgates, drops, sand-gates, etc., and of dams and reservoirs.

It is hoped, in this course, to give the special instruction which will fit those taking it to meet the problems of irrigation and irrigation construction of this country.

The Department possesses current meters, a Darcy-Pitot tube, floats and other means of gauging, apparatus for experimenting on the flow of water, and many other useful instruments.

A large collection of photographs and plans of irrigation structures aid very materially in the study of present practice.

Among the works accessible are the following:

The State Engineer's Reports of Colorado and California; Government Reports on Irrigation; Moncrieff's Irrigation in Southern Europe; Smith's Italian Irrigation; Buffon's Caneux d'Irrigation d'Italie, Septentrionale; Buckley's Irrigation Works of India; Herrisson's Report on the Italian Canal; Deakin's Australian Reports;

Buffon's Hydraulique Agricole; DeCossigng's Hydraulique Agricole; Buffon's Usines; Francis, Lowell's Hydraulic Experiments; Cunningham, Darcy and Bazin, Lesbros and others experiments, and many other French, Italian and English works.

The department invites donations of plans, photographs and information of irrigation structures, as of dams, flumes, headgates, reservoirs, etc.

THE EXPERIMENT STATION.

The Experiment Station includes the Central Station at the College and the sub-stations at Del Norte and Rocky Ford; these comprise one department of the College.

It was created in accordance with the Hatch act, and its work arranged in conformity thereto.

Bulletins and reports are issued from time to time, any of which can be had upon application addressed to "The Experiment Station," Fort Collins, Colorado, as long as the editions last. Several are exhausted.

Seeds are also distributed of those raised at the Station, or which come into the hands of the Board of Agriculture from other sources. All applications for seeds should be addressed to the "Secretary of the Board of Agriculture," Fort Collins, Colorado. All cannot be supplied, as has been abundantly shown this year; but such seeds as we have, and in such quantities as to be of the most use to our many applicants, will be sent out, where, in our judgment, they will do the most good.

MENTAL SCIENCE.

This study is pursued during one term in the Senior year, in such a manner as to give a good outline, which the student is expected to fill in largely by supplementary reading. Porter's "Elements of Intellectual Science" is used as a text book and guide.

LOGIC.

The study of this branch is considered of prime importance, as in the presentation of the inductive we find the method pursued for the advancement of science and the means of elimination of error from experiment. The term's work is equally divided between the inductive and deductive methods.

POLITICAL ECONOMY.

Lectures and discussions are used. The short term only gives sufficient time to arouse an interest in the divisions of the subject and its leading principles; the student is induced to read, to weigh carefully, and thus to act intelligently on the questions which interest us as a nation in our growth and increase of wealth.

CIVIL GOVERNMENT.

The study of the Constitution of the United States and of the State of Colorado both conjoin to make more broad the mind of the student and the better fit him to take his place among the citizens of this or other States. These, with other subjects relating to civics, will be given by a series of exercises in the Senior year.

PUBLIC RHETORICALS.

Each student enrolled shall render at least one public rhetorical exercise each College term, unless excused by Faculty vote. These exercises shall consist of declamations and recitations for the younger classes, and original exercises for the advanced students. The importance of these exercises to the student can scarcely be estimated, as every one should have a training which will enable him to present his views upon any question in public in an intelligent and pleasing manner.

DEGREE.

Upon those who complete the work of any one of the four courses in a good and satisfactory manner, the State Board of Agriculture, upon recommendation of the Faculty of Instruction, confer the degree of B. S. (Bachelor of Science). The fee for graduation is fixed at $10, without other public expense to the student.

The degree of M. S. (Master of Science) will be conferred upon all graduates of the College in good standing, who have pursued thoroughly some line of work after graduation, and who submit an acceptable thesis on the same.

EXPENSES.

Entrance fee (paid once for full course)	$ 5 00
Term fee	1 00
Board in Dormitory (includes room rent, heat and light) per week	3 35
Graduation	10 00
Tuition	Free
Uniform (approximately)	20 00

Washing costs about seventy-five cents per dozen, and must be done in town. The Dormitory has rooms for thirty students. Those who are obliged, by late application, to seek board and room in the city pay from $4 to $6 per week. A few board themselves, and thus reduce the expenses very materially.

The rooms in the Dormitory are each to be heated by steam for the year 1890-91, and we also hope they will be lighted by electric lights. They contain a bedstead, and students must furnish all other articles of furniture. The conditions of occupancy are:

1. Good conduct.
2. A care for and preservation of property.
3. A cheerful compliance with the regulations governing that part of the College.

Each student having room in the Dormitory must make a deposit of $2.50, for guarantee of good use of the room. This will be returned at the end of the time he has used the room, provided the room or furniture has sustained no injury other than that caused by ordinary wear and usage.

TOTAL EXPENSES.

As many persons desire information as to the total cost of attendance for a year, the following summary is made:

Entrance fee (paid once)	$ 5 00
Term fees	3 00
Board, 40 weeks at $3.35 per week	134 00
Washing (approximately)	20 00
Books (approximately)	15 00
Total	$177 00

This does not include clothing or traveling expenses. Also, in terms when students are assigned for labor to the farm and garden, their wages may be used to lessen their expenses, so that an average of $150 will pay the yearly expense of any economical student during the whole course, when clothing, traveling expenses and incidentals are excluded.

CHEMICAL FEES.

Sophomore year, each term $5.00	$10 00
Junior year, each term $5.00	10 00
Total for Chemical course	20 00

SHOP FEE.

Shop fee, per term	$ 5 00
Wood carving, per term	2 00

The fees in Chemistry and in the Manual Training department are small and only intended to cover the cost of material used by the student. The fee saves the institution from actual loss.

ADVANCE PAYMENT.

All fees must be paid in advance, and a receipt obtained from the Secretary entitles the bearer to admission to the classes. Board must be paid monthly in advance to the steward in charge of the boarding hall, and no reduction is made, unless for absence of a full week at one time. In such case, one-half the time is allowed. An absence of two consecutive weeks, entitles one to full reduction of time. A student leaving before the end of the term has any excess or balance to his credit refunded to him on settlement.

MONEY NEEDED BY STUDENT ON ENTRANCE.

Entrance fee	$ 5 00
Term fee	1 00
Board (advance four weeks)	13 00
Room rent (about)	1 00
Uniform	20 00
Furniture for room, from $8 to $11 (average)	10 00
Books	5 00
Deposit	2 50
Incidentals for washing, etc.	5 00
Total	$62 50

It will be seen that a student needs about $75.00 to begin attendance at the College.

Conditions of Admission.

The College admits students of both sexes. Candidates for admission must be fifteen years of age, and unless personally known, must give good references. They must also pass an examination in the common branches, viz.: Reading, Writing, Spelling, Grammar, Arithmetic and Geography. The work of the Preparatory year is, in part, a thorough review of Grammar and Arithmetic, with the additional subjects of United States History, Physical Geography, Elocution, Composition, Word Analysis and Drawing.

EXAMINATIONS FOR ENTRANCE.

Examinations for admission to the Freshman class will be as follows:

In *Reading*, candidates must be able to read understandingly, and with proper accent and emphasis.

In *Writing* and *Orthography*, they must be able to write from dictation, sentences from standard pieces of English literature, both prose and poetry, sufficient in number to test their qualifications in Penmanship and Orthography.

Candidates will also be required to pass examinations in *Arithmetic*, *Grammar* and *Descriptive Geography*.

Candidates for advanced classes or work must be examined on all previous work, or bring certificates of standing from schools having an equivalent grade of work.

Those desiring to enter the Preparatory class must show some knowledge of Grammar, and be examined in Arithmetic as far as interest, and in Descriptive Geography. They must show a general knowledge sufficient to enable them to take up the work.

Specimen question follow, so that candidates may gain an idea as to what will be required upon presenting themselves for entrance to the Freshman class.

Similarly thorough examinations will be made for admission to higher classes in all subjects completed by them:

ARITHMETIC.

1. Explain clearly and accurately the objects of Arithmetic and the methods of writing and reading numbers, entire—fractional, compound or denominate.

2. Explain the operation of division of whole numbers—abstract and compound or denominate, giving rule with its reasons.

3. Explain nature of prime numbers and factors of a number, of a common divisor, greatest common divisor, and give rule, with its reasons, for obtaining it.

4. Explain nature of decimal fractions and give rule, with its reasons, for multiplication of.

5. Define terms, ratio and proportion. Give properties of the latter and the rule, with its reasons, for the statement and solution of questions in simple proportion or single rule of three.

6. Find value of $5\frac{3}{4}$ — 4 1-7 + 5-28 ÷ $1\frac{1}{2}$x$2\frac{1}{3}$.

7. Divide 7.58405 by 11.7. Express dividend, divisor and quotient in words.

8. Find number of bushels in a bin 10 ft. x 12 ft. x 5 ft. Number of gallons in a cubical cistern whose edge is 6 ft.

9. At what per cent. above cost must a man mark a book that he may take off ten per cent. of marked price and still have ten per cent. profit.

10. Find principal that will amount to $1,111.11 in 11 years at 11 per cent.

GRAMMAR.

1. English Grammar teaches the use, knowledge and science of what?

2. What are the parts of speech, and why so called?

3. The office and use of each in the various positions they occupy in a sentence?

4. Define the different parts of a sentence, viz., principal parts, modifiers, phrases and clauses.

5. Define the modifications of a noun, viz., person, number, gender and case.

6. Define voice, mode and six tenses of the verb.

7. Name and define the pronouns, viz., personal, relative, interrogative and demonstrative.

8. What is comparison of adjectives and adverbs?

9. Define simple, compound and complex sentences.

10. Define a declarative, an interrogative, an imperative, an exclamatory sentence.

DESCRIPTIVE GEOGRAPHY.

Questions will be asked upon the following topics:

GENERAL.

1. Definitions of divisions of the earth's surface, land and water, zones, latitude and longitude.

2. Location of large bodies of water.

3. Points with reference to important mountain chains.

4. Ditto in regard to islands.

5. Ditto in regard to rivers.

6. Ditto in regard to lakes.

SPECIFIC AND LOCAL—UNITED STATES.

7. The location and termini of important lines of communication by rail and water.

8. Boundary and location of selected States and groups of States.

9. Prominent geographical features of the United States, as rivers, mountains, lakes and the like.

REGULAR AND SPECIAL COURSES.

Unless there seems to be strong and excellent reasons for it, students will not be allowed to take a special course of study, and in case it is allowed, the student must show that he is well qualified to pursue the studies selected by passing such examinations as the Faculty may assign. No student will be allowed to change his course during the progress of a term, nor will he be allowed to drop a study unless by permission of the Faculty.

LEAVING COLLEGE.

A student will not be allowed to leave College in term time without leave of absence granted by the President or Faculty, otherwise the student will be liable to *suspension* or *expulsion*. Temporary leave of absence can be granted by the President, or the officer in charge during his absence. Final separation from College must be acted upon by the Faculty.

LABOR.

The labor of students at the College is required by law; each student must labor two hours each school day, unless excused for physical disability. The labor at the College is of two classes: First, that which is performed solely for the purpose of instruction; second, that which of is some monetary value to the institution.

In the first class is placed all labor performed in Chemical laboratory practice, in Mechanic shop, in field surveying and leveling, and some labor in Conservatory. In the second class is included all labor upon farm or garden, and extra time in the Mechanic shop, when the student has acquired a sufficient degree of skill. The rate paid for labor of the second class varies with the skill and fidelity of the student. The maximum price is ten cents per hour. It is believed that the students of the Agricultural College or of any industrial school are able to accomplish as much in the line of study as if no labor were performed. At the same time, the labor helps to keep the physical nature strong and healthy, while the student, by learning well the principles of many trades and vocations, is made strong to grapple with the duties and responsibilities of life, while being educated to take his place among the best and most honored citizens of the future. The time that in many colleges is spent in revelry or athletic sports of questionable utility, is thus devoted to that which is not only a present benefit, by helping to support the student while in College, but gives him a ready means of support in many ways as soon as he leaves the College halls.

DISCIPLINE.

The discipline of the College is mild, but firm; the Faculty, however, reserve the right to suspend pupils with or without the knowledge of the parents, according to the circumstances of the case. Good conduct and effort is expected of all. When it becomes manifest from the deportment of any student that his presence is detrimental to the best interests of the school, either morally or otherwise, such student will be removed.

DORMITORY REGULATIONS.

Young men must obtain permission from the steward in charge to be absent from the Dormitory any evening except Friday and Sunday. Study hours begin at 7 p. m. and close at 10 p. m. The time for retiring is fixed at 10:15 p. m.

Any marked violation of the above regulations will be followed by warning and advice; if still persisted in, the student will be suspended from the Dormitory, if not from the College. Students boarding outside must obtain permission of the Steward before visiting the Dormitory. Damage to rooms or property about the Dormitory will be assessed to the one occupying the room, or to the whole body of Dormitory students if the responsible parties are unknown.

COLLEGE REGULATIONS.

Each student is expected to maintain a grade of 65, on a scale with 100 as perfect. Any student who fails to maintain this grade will be reported to the Faculty by the Professor in charge of such study or labor, after which such student shall have two weeks in which to raise his grade; at the end of this time, if such student fails to raise his grade, he shall be suspended from the school, unless there be some extenuating circumstance, when the rule shall be inoperative. A student is graded as passed in any study or branch of manual practice when the average of his daily progress and his term examination equals 65, on a scale of 100 as perfect.

MEANS FOR

Instruction and Illustration.

The College hall, with the new addition just completed, contains fine, large recitation rooms for the following departments: Mathematics, Mechanics and Drawing, Agriculture, Physics and Irrigation Engineering, and History, Literature and Language; also, fine, large and commodious Library and Reading rooms, large Museum, Zoological Laboratory and recitation room, with work room; also, fine offices for officers of the College, rooms for Board of Agriculture, Faculty, etc. Finally, there is a large and well arranged Assembly room, with opera chairs for seating 300 persons, stage, retiring rooms, cloak rooms, etc., attached, for the convenience and comfort of the school and the public. The whole is heated by steam and admirably lighted by electric lights from the works of the Fort Collins Electric Light Company. The basement is heated and lighted, and contains a large Armory, 40x72 feet, for purposes of drill and gymnasium, the heating plant, bath rooms, rooms for janitor, storage, etc.

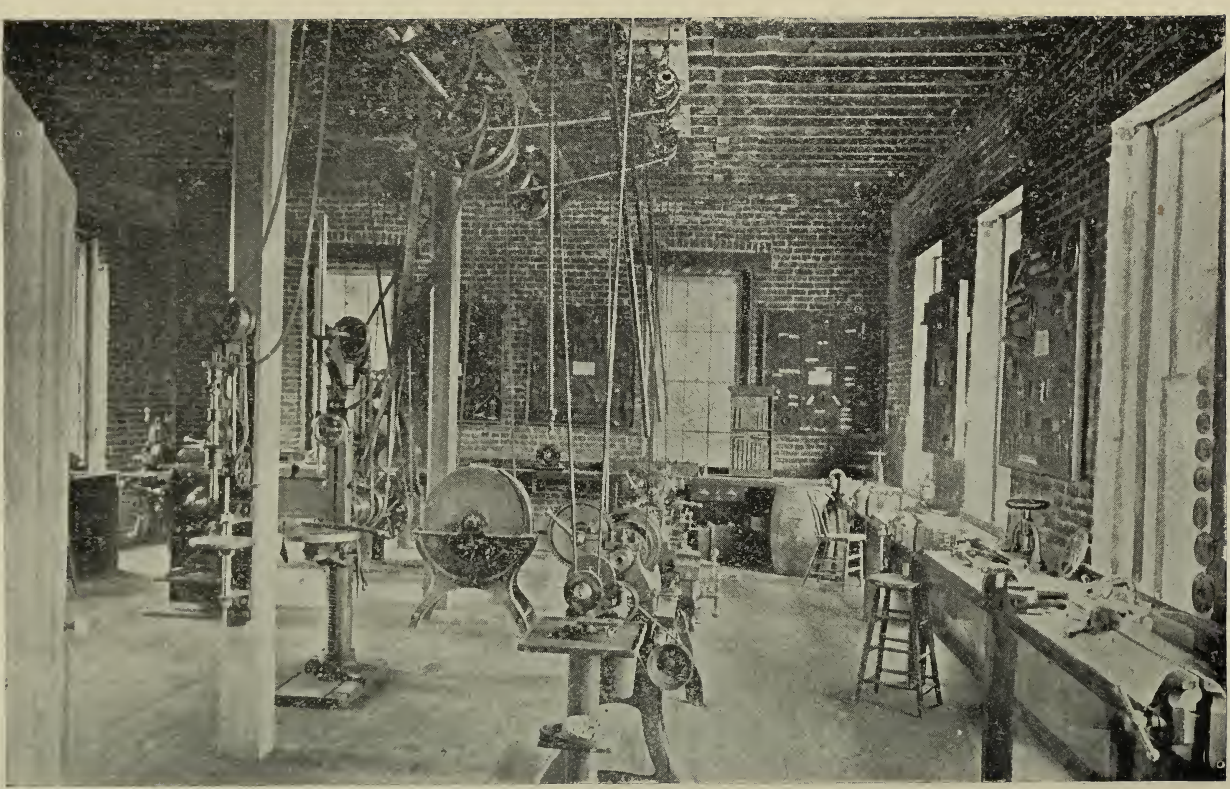
The Chemical Laboratory, with lecture room for forty students; also, work or analytic room, with desks for twenty-four students, each desk being supplied with the water and gas for use of each student, and convenient hoods for ventilation; also, Station Laboratory, with balance room, distillation room, etc.

The Botanical and Horticultural Laboratory, completed in May, 1890, with fine rooms for instruction and laboratory work, office, tool room, seed room, grafting room, and ample basement room for storage. The Conservatory attached, 20x50 feet, with curve roof and 1,500 feet of glass, containing about 500 species, or 10,000 plants, representing many interesting and rare botanical families; heated by improved hot water apparatus.

The orchards and grounds carefully laid out and planted to ornamental shrubs and trees, the planting of forestry and the propagating ground of the same, the kitchen garden, with its many varieties of vegetables and small fruits, hot beds and cold frames.

The Mechanic Shop, consisting of main building, 25x56 feet, two stories in height, with a rear portion, 20x60 feet, of one story. The upper floor of the main building is fitted with benches for sixteen students in wood work, desks and tools for ten students in wood carving, four wood lathes, two scroll saws and one double circular saw bench. The lower floor contains an iron working room, with twelve benches for work in filing, scraping, etc., a speed lathe, two engine lathes with attachments, a shaper, a planer and two drilling machines. In addition, this room is supplied with a good assortment of bench tools. There is also an office and a wash room, besides a wide hall containing the twelve-horse power engine, and from which rise the stairs to the floor above. The rear portion contains boiler and coal room, forge shop with six forges, furnished with blast from a Sturdevant rotary blower, and a foundry room. The machinery and appliances are first-class in every respect.

The farm of 240 acres, with a large part under cultivation, including the experimental ground of eight acres, containing twenty-five series of plats of seventeen in each



MECHANIC SHOP—MACHINE ROOM.

series, each plat containing two square rods. The whole ground is surrounded and the plats divided by convenient walks and drives. In pure stock, we have Jersey and Shorthorn cattle and Berkshire swine.

Connected with the departments of Physics and Engineering, we have two fine water meters and a full set of meteorological instruments; also, a full set of standard weights and measures, recently prepared for each Agricultural College in the United States, according to joint resolution of Congress to that effect; besides these, we have apparatus for illustrating lectures on the various branches of the subject, especially hydraulics, which has so direct a bearing on the subject of division and flow of water.

The Military department has seventy cadet rifles and two 3-inch rifled field pieces from the War Department, and each year there is issued a supply of ammunition for both branches of service, in order to give training in infantry skirmish drill, target practice, and artillery firing.

The Scientific department is supplied with a fine cabinet of specimens, illustrating Botany, Entomology, Geology and Mineralogy, Zoology and Comparative Anatomy.

The Mathematical department is supplied with two good engineer's transits, a Wye level (15 inch), compass, rods, chains, etc., for practical field work in surveying and engineering.

LOCATION.

Fort Collins, the site of the College, and the county seat of Larimer County, is a fine town of about 3,000 inhabitants, situated in the beautiful and fertile valley of the Cache la Poudre river, just as it emerges from the foothills which skirt the snowy range. Extended views of the foothills and the ranges greet the eye, stretching away to the north and the south, and culminating in Long's Peak, with its twin points, which seem like sentinels to guard this portion of the range. In other directions lie fields of growing grain and alfalfa, and gardens of fruits and vegetables. For healthfulness, the location cannot be surpassed. There are fewer and less disastrous storms and sudden changes than at any other point on the slope.

The town is having a thriving and steady growth, is well governed, and is taking an advanced position in regard to education and other matters of public import.

The College is situated at the south side of town on gently rising ground. It is connected with the city system of waterworks, by which good, pure water is furnished for all purposes, the buildings heated by steam and lighted by electric lights. The various buildings are located on either side of the Colorado Central Railroad, and front on College Avenue, one of the finest residence avenues in the city.

The town is easily accessible from all parts of the State by means of the Colorado Central and the Greeley, Salt Lake & Pacific Railroads, by which six trains arrive and depart daily, carrying passengers and mail.

HISTORY.

The State Agricultural College of Colorado, in common with those of other States, had its origin in an act of Congress, passed July 2, 1862, which granted 90,000 acres of land as an endowment fund for a College, "where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in order to promote the *liberal* and *practical* education of the industrial classes in the *several pursuits* and *professions* of life."

No benefit was received from this grant until an act of Congress, passed April 24, 1884, confirmed it to the State. The land is now located, and a part sold, the proceeds from which are to form a perpetual endowment fund.

The State has very generously supported the College by the passage of an act (1883), levying a tax of one-fifth of a mill annually on each dollar of valuation.

The College was incorporated by the act of 1870, and the act amended in 1872, and again in 1874, but no steps were taken toward the erection of a College by the Board in charge. In 1877, by death of the President of the Board and removal of other members from the State, an emergency was declared to exist and a new law was passed, which was given immediate effect. To the State Board of Agriculture, as thus reorganized, was entrusted the work of building a College.

The town of Fort Collins was selected as its site, and at a meeting held February 27, 1878, it was determined to erect a building suited to College purposes. The corner stone was laid July 29, 1878, and in the same year the first building was completed. The College was not opened for the reception of students until September 1, 1879. The Dormitory was erected in 1881, and the Chemical Laboratory in 1882, but not thoroughly fitted for work until May 1883. It was enlarged for Station work in 1888.

A small propagating house was built in 1882, for the purpose of aiding Horticulture. The present Greenhouse with its curvilinear roof and all modern appliances, was completed September 1, 1883. On the same day the Mechanic Shop was completed, its machinery in order and ready to run.

On June 1, 1890, was completed the large addition to the main building, and also the new Botanical and Horticultural Laboratory, thus giving largely increased facilities for work.

The College now comprises the following distinct departments: Agriculture; Botany and Horticulture; Chemistry and Zoology; History, Literature and Modern Language; Mathematics; Mechanics and Drawing; Military Science; Physics and Engineering, and the Experiment Station.

CALENDAR.

1890-91.

SEPTEMBER.

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